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IMPROVING LOGISTICS REALISM IN COMMAND POST EXERCISES INVOLVING THE KC-135A/E/R AIRCRAFT USING A HISTORICAL AIRCRAFT MAINTENANCE DATABASE MODEL

THESIS

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The opinions and conclusions in this paper are those of the author and are not intended to represent the official position of the DOD, USAF, or any other government agency.

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THESIS

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Lyndon S. Anderson

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Abstract

This ~~study~~ thesis, under the sponsorship of HQ SAC/LGL, investigated a method to improve realism in Command Post Exercises (CPX) involving the KC-135A/E/R aircraft by developing a historical database model. The model is based on the premise that realistic data collected from actual war-like missions can be placed in a database for use by response cell members to provide simulated, yet realistic, logistical requirements during CPXs. European Tanker Task Force flying mission data was used as source data for the development of the model. Associated documentation was also developed to support the model. A mock exercise simulating a CPX was used to test the model and its associated documentation. Analysis of the test results lead the researcher to conclude that the model provides response cell members with a useful tool to obtain realistic logistical information they need to carry out their duties effectively. Recommendations include using the model and documentation as required by HQ SAC/LGL, and conducting further research to test the hypothesis that historical database models improve realism at the response cell level during CPXs. Keywords:

Cargo aircraft, Transport aircraft. (KR)

IMPROVING LOGISTICS REALISM
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USING A HISTORICAL AIRCRAFT MAINTENANCE DATABASE MODEL

I. Introduction

Background

The national defense of the United States depends on the ability of its military to successfully accomplish national defense objectives. Of critical importance to the military is how it prepares to carry out this tasking. During peacetime, the military is always faced with the dilemma of maintaining force readiness. A primary method for maintaining force readiness is through the use of military exercises.

Military exercises offer a tremendous opportunity to prepare military forces for war. They have become one of the most effective ways of educating military forces on the experiences and rigors of war short of actual combat. More effective still, are military exercises that successfully create the illusion of reality. Realistic exercises can be an extremely powerful influence, especially on those who have limited operational experience (Perla, 1985:77). With each passing year, fewer people with actual combat

experience remain in military service (Furlong, 1984:4). Of critical importance, then, is generating as much reality as possible within military exercises to get as much educational value as possible for an ever increasing inexperienced force. Inexperience within the military can have serious consequences in time of war. Failure to train realistically can lead decision makers to draw conclusions about war that could be disastrous (McCarty, 1988:2).

Improved exercise realism can be accomplished through the use of logistic considerations. Frequently, as seen throughout history, logistic considerations have been the deciding factor between victory and defeat.. The classic and universal military problem of ignoring logistics (Russo, 1987:7) must be overcome. To put logistics in proper context, Lt Col McCarty relates it to strategy and tactics by stating "what a commander wants to do (strategy) through the use of military forces (tactics) is almost totally dependent on what there is to do it with (logistics) (McCarty, 1988:19)."

Logistic considerations must assume equal prominence with strategy. It has been written that there can be no strategy without logistics. Jerome Peppers supports this by identifying two important reasons. First, all nations are constrained by limited resources, and as such, require a logistics system to effectively use what resources are

available. Second, a logistic system is made up of everything other than operational employment, and must be treated as such. Failure to do so can lead to a "dangerously thin and weak philosophical foundation (Peppers, 1986:14)."

With these points in mind, military planners must reconsider the objectives of military exercises with a central issue revolving around how the element of realism can best be achieved (Hall, 1989:Ch 1, 2).

A number of logistical models have been developed to provide improved realism in military exercises. The most widely used model is mathematically based and uses random number generators to determine logistic requirements. For example, with command post exercises (CPX), the logistic requirements often controlled by a random number generated model include aircraft landing status, aircraft availability, and time needed to repair the aircraft (Hall, 1989:Ch 2, 9).

A second type of logistic model, an aircraft maintenance database, can be used to improve realism in military exercises. This model is based on the premise that historical data collected from actual aircraft deployments can be used as both input and output for the model. With this approach, the input of actual aircraft maintenance data is captured and reused as output during an exercise. The result thereby dramatically improves the realism of the

logistic requirements of the exercise. The concept has an added advantage of simplifying what otherwise would be a difficult project to model using mathematical techniques (Hall, 1989:Ch 1, 7-8). As with the random number generator model, logistic requirements most often controlled by the aircraft maintenance database model during CPXs include aircraft landing status, aircraft availability, and time needed to repair the aircraft. Aircraft availability is a critical limiting factor in force employment. Consequently, "a valid, mature and consistently reliable means is needed to govern aircraft availability and other logistic requirements during command post exercises where practically all forces are simulated (Hall, 1989:Ch 1, 3)."

General Issue

The Directorate of Contingency Logistics (LGL) at Strategic Air Command (SAC) Headquarters wants to expand the use of an aircraft maintenance database model to improve logistics realism during European Command Post Exercises. The B-52G aircraft maintenance database model has improved management of aircraft availability, and has improved the establishment of aircraft logistical requirements at the response cell level during CPXs.

Problem Statement

Logistics realism needs to be improved during command post exercises involving KC-135A/E/R aircraft.

Research Objective

The objective of this research effort is to develop an aircraft maintenance database model for the KC-135A/E/R aircraft. The model will be an extension of the B-52G aircraft maintenance database concept (See Hall, 1989:Ch 1, 4), and will be used by Strategic Air Command during command post exercises. The researcher shall refer to the model as the KC-135A/E/R database model.

Investigative Questions

The researcher will use the following investigative questions to guide this research, and test whether the concepts and design of the KC-135A/E/R database model can improve logistics realism over current methods.

1. Can data from KC-135A/E/R aircraft flying European Tanker Task Force missions more accurately depict aircraft maintenance requirements than routine peacetime flying data?

2. Does statistical analysis support or reject the null hypothesis that there is no improved difference in logistics realism between the KC-135A/E/R database model and mathematical models currently in use?

3. Can the KC-135A/E/R database model be used to determine aircraft availability based on logistical support levels?

4. Can realistic demands for aircraft spare parts be determined effectively using the KC-135-A/E/R database model?

5. Can the KC-135A/E/R database model be designed in a manner for use in compressed exercise schedules?

6. What limitations does the KC-135A/E/R database model pose on response cell personnel, and what effect do these limitations have on the objectives of the command post exercise? (Hall, 1989:Ch 1, 8-9)

Scope

This thesis effort will provide a validated aircraft maintenance logistics database for Strategic Air Command's KC-135A/E/R tanker aircraft only. The basic concept, however, can be expanded to include other weapon systems simulated during CPXs (Hall, 1989:Ch 1, 9).

Assumptions

The KC-135A/E/R database model is developed based on the assumption that the ETTF source data represents the best available data that depicts expected wartime mission requirements.

Limitations

The KC-135A/E/R database model is limited in its use by factors that make up the source data. Factors such as mission duration, repair turn around time, integrated combat turn procedures, and surge conditions affect the development of the KC-135A/E/R database model. Use of the model for

applications with markedly different preconditions may induce errors that may cause less realistic outcome from the model (Hall, 1989:Ch 1, 10). For example, during integrated combat turns, the aircraft repair time (turn around time) is generally much shorter because maintenance and refueling procedures, normally performed separately, can be performed concurrently.

Key Terms and Definitions

Aircraft Maintenance Database. A historical collection of related maintenance and supply data arranged as a tabular handbook that provides detailed aircraft logistical information to response cell personnel for use during command post exercises.

Aircraft Maintenance Landing Code. "Codes assigned to support inflight discrepancies during the provisioning process to indicate to maintenance and supply personnel the maintenance levels authorized to remove and replace, repair, overhaul, assemble, inspect and test, and to condemn items (McCann, 1981:409)."

Command Post Exercise. "A military exercise in which the existence and movement of combat forces is simulated (Hall, 1989:Ch 1, 11)."

Database. "A collection of detailed information on the actual procedures used in planning and executing an activity (McCann, 1981:194)."

European Tanker Task Force. A task force comprised of tanker aircraft temporarily formed to support European flying missions.

Field Training Exercise. "An exercise conducted in the field under simulated war conditions in which troops and armament of one side are actually present, while those of the other side may be imaginary or an outline (DoD, 1987:143)."

Job Control Number. A seven digit number assigned to a specific inflight discrepancy for use by maintenance personnel.

Maintainability. "A characteristic of design and installation expressed as the probability that an item will be restored to a specific condition within a given period of time when the maintenance is performed using prescribed procedures and resources (McCann, 1981:406)."

Military Exercise. "Any practice operation for the purpose of increasing proficiency of personnel in the performance of their tasks. In an exercise, simulated enemy action is used as a training device for the friendly forces, and may be wholly or partly imaginary. Unlike a maneuver, an exercise is not intended to test proficiency, but is used to develop it (Heflin, 1956:193)."

National Stock Number. "A two part 13 digit stock number assigned to each item of supply repetitively used, purchased, stocked, or distributed within the federal government (McCann, 1981:466)."

Nomenclature. "A set or system of official names or titles given to items of material and equipment (McCann, 1981:471)."

Response Cell. "A small group of people deployed to a forward operating location during command post exercises to complete the communications loop to various head quarters and simulate the existence, capabilities, and requirements of combat forces (Hall, 1989:Ch 1, 12)."

STARTEX. "Start date and time of military exercise (Hall, 1989:Ch 1, 12)."

Task Force. "A temporary grouping of units under one commander formed for the purpose of carrying out a specific operation or mission (Quick, 1973:473)."

War Game. "A simulation, by what ever means, of a military operation involving two or more opposing forces and using rules, data and procedures designed to depict actual or assumed real life situations (Quick, 1973:496)."

War Readiness Spares Kit (WRSK). "An air transportable package of spares and repair parts required to sustain planned wartime or contingency operations of a weapon system for a specified period of time pending resupply (McCann, 1981:738)."

Work Unit Code (WUC). "An alpha-numeric code made up normally of two alpha characters which identify a specific subsystem of an aircraft or other major equipment and three numbers which identify a specific component within a subsystem (Hall, 1989:Ch 1, 13)."

Summary

This chapter provided an introductory explanation of the need for increased logistics realism in military exercises. Additionally, the specific research objective, key investigative questions, research scope and limitations were all discussed and will be used to direct the research effort. Chapter II will provide a review of the applicable literature.

II. Literature Review

General

Preparation for war through peacetime training, as Karl Von Clausewitz aptly explains in his book, On War, is a time honored concept we in the Department of Defense must continue to exploit to the fullest (Clausewitz, 1950:332). The ancient philosopher Horace once said, "a wise man in times of peace prepares for war (Heinl, 1967:247)." Military exercises provide the opportunity to test and improve the capabilities of our forces short of actual combat (War Games 1984:1). A key element to the success or failure of any military exercise is the element of logistics. "Logistics provides the means and arrangements that bring strategy and tactics together to provide combat power (Heinl, 1967:175)." Good planning includes logistics and should go a step further and include the element of realism. Realism by definition integrates logistics, strategy, and tactics to provide a scenario that reasonably replicates war. Realism prepares commanders for success in combat (Hall, 1989:Ch 1, 5).

Command post exercises (CPX) attempt to provide logistics realism by using different modeling approaches. These exercises simulate the existence and movement of combat forces, and heavily task communications and coordination of the various elements of the exercise (Perry, 1987:9; Hall and Miller, 1990:33). The [Air Force] should strive to

achieve as much logistics realism as possible in CPXs to develop the wartime skills of our senior leadership and their staffs by teaching them how to respond to realistic wartime scenarios (Hoover, 1984:27). This literature review examines the components: military exercise, logistics, realism, and command post exercise to better explain their relationships.

Military Exercises

Military exercises have long been recognized as an important element in any effective military organization. Field Marshal Erwin Rommel, a German battlefield General of World War II, once said: "the best form of 'welfare' for the troops is first-class training (Heinl, 1967:323)." Military exercises provide that training and give us an opportunity to learn new procedures, learn from mistakes, and hone warfighting skills. The practice we gain from military exercises will eventually lead to a smooth, more effective combat force.

Though military exercise should be used as tools to improve war fighting capability, they are often misused and fail to provide objectivity; rather, they may reflect a biased point of view or promote a position favored by the initiators of the exercise. Our system of validating exercises tends to favor those exercises we win while labeling those exercises we lose as "unfair" or "unrealistic (Fur-

long, 1984:6-7)." Lt Cmdr John Melos (a pseudonym of an active duty Naval Officer), states that "Naval exercises frequently ignore inconvenient threats and disregard friendly force losses (Melos, 1988:76)." He goes on to say that commanders believe "exercises must be a success where U.S. forces win (Melos, 1988:76)." This approach can result in planning that ignores potential threats in a real-world situation. The general attitude prevailing in military exercises is that the enemy is allowed to play, as long as they don't adversely effect the desired outcome of the exercise (Melos, 1988:77). Officers in charge of an exercise will often attempt to create conditions that favor success because they don't want it to appear that units under their command "failed" during an exercise (Melos, 1988:76). Our commanders must understand that we often learn more by losing in a military exercise than in winning (Furlong, 1984:7).

Throughout this literature review many articles voiced criticism of military exercises with little emphasis on ways to improve. Lt Col Hoover, however, in his article, "Logistics Realism in Exercises", proposes several basic improvements for military exercises:

1. Expand senior management awareness of the criticality of logistic realism in exercise activity.

2. Establish an active exercise management organization at HQ USAF level to focus on logistics aspects.

3. Eliminate current exercise magic and success assured planning.

4. Have fewer exercises of better quality. (Hoover, 1984:29)

Another method of improving the performance of military exercises includes well thought-out logistical plans.

Logistics

Commanders of a military exercise must be fully aware of how logistics can affect the progress and outcome of the exercise (Eccles, 1982:23).

The need for commanders to understand the interrelationship between logistics, strategy, and tactics is essential to success in war. The primary objective of logistics is to sustain our combat forces (Eccles, 1959:35). Failure to consider logistic requirements can lead to a misunderstanding of what levels the logistics system can or cannot support (Hall, 1989:Ch 5, 1). As Rear Admiral (ret) Henry E. Eccles states in his book, Logistics in the National Defense, "Strategy and tactics provide the scheme for the conduct of military operations; logistics provides the means therefor (Eccles, 1959:19)." It is important, then, to

realize that no strategic decision can be correct unless adequate consideration has been given to logistics (Peppers, 1986:14).

There is often a communications disconnect between logisticians and operators in understanding the principles of logistics and how they relate to the bigger picture of operational strategy and tactics. Col Gene S. Bartlow, in his article "The Operator-Logistician Disconnect," states that operators and logisticians must understand each other's world (Bartlow, 1988:23). He explains that operators often don't understand the role logistics plays in warfare, and logisticians don't understand the concepts of operation (Bartlow, 1988:23). Because of this disconnect, well planned exercises from an operations point of view will often overlook logistical requirements (Ogan, 1983:21).

As commanders gain an understanding of how logistics plays in warfare, they can factor logistics realism into plans and concepts. Together, logistical requirements and operational concepts can then be periodically exercised to ensure operational requirements are met (Bartlow, 1988:23; Gorby, 1980:25).

Realism

Karl Von Clausewitz believed logistics realism must be present in military exercises so officers can receive training in the "mechanical aspects of war (Furlong, 1984:5)." Realism then, is the application of truthful planning factors for the situation described in the exercise scenario (Hoover, 1984:27). Without logistics realism in military exercises, officers become dubious in the presence of danger, death, and live ammunition (Heinl, 1967:57).

Logistics realism is imperative to any successful military exercise. If an exercise does not provide realism, the benefit of practice in real world application is lost (Hoover, 1984:27). Exercise realism is a fundamental ingredient to gaining and maintaining the highest degree of military proficiency (Hoover, 1984:27). When exercise realism is coupled with logistics realism, commanders can understand the types of material problems they may face. Improved exercise and logistic realism will help commanders prepare for the process of directing units and fighting in a wartime environment (Furlong, 1984:5).

Lt Gen Raymond B. Furlong believes realistic military exercises should identify and develop those officers who have the character and intellect needed for success in warfare (Furlong, 1984:5). To do this, he explains that exercises must reproduce "danger, exertion, uncertainty, and

chance," along with resource limitations and resource losses (Furlong, 1984:5). Lt Cmdr Melos supports this point as well. He adds that realistic elements force the commanders to experience the handling of forces that have taken losses, instead of commanding forces that remain intact (Melos, 1988:77). They learn to find out what really works and what does not (Melos, 1988:77). Though realism is essential to the development of sound leadership, it is constrained by the element of time.

Time plays an important role with respect to realism. Usually there is not enough time allowed in an exercise to achieve the levels of realism needed to meet the objectives of the exercise (Hagel, 1989:Ch 1, 4). However, with improved planning, logistics realism can be incorporated in exercises while staying within the time constraints of the exercise and still provide a high degree of realism (Hoover, 1984:29). More important, though, are the effects simulations have on realism in military exercises.

Simulations (or artificialities), if used unwisely, fail to provide a realistic picture of events to the commanders (HQ MSG 102025Z, 1988:2-3). The simulations are often so deeply entrenched within the exercise that commanders are not confronted with realistic logistical issues that may dramatically affect operational decisions during actual war (Eccles, 1959:300). Fortunately, exercise real-

ism is becoming an increasingly important concern for our senior leadership. The Joint Chiefs of Staff have issued a mandate to all Services requiring they develop improved procedures to eliminate needless exercise artificialities and improve realism (Hall and Miller, 1990:33).

Wise use of simulations, though, allow an exercise to challenge the commander's war fighting capability without requiring his wartime resources to be in place. This is often the case with command post exercises.

Command Post Exercises

Command post exercises are designed to test wartime procedures while simulating the existence and movement of combat forces. As Maj Gregg T. Perry explains in his article "Limitations of JCS Exercises,":

> CPXs tend to be manpower intensive both in planning and in execution. Some unique limitations of CPXs include scenario script dependency, where the exercise is tightly controlled by a set sequence of events. Heavily scripted CPXs occur because planners must create situations that drive the players to exercise the procedures which will accomplish specific objectives. CPXs are also limited by level of play constraints. By design, these exercises test the planning and command-control procedures to include our highest levels of government. Often, this means the level of play will include the National Command Authorities (the President and Secretary of Defense), the Joint Chiefs of Staff, and/or the Unified commanders. Exercise play at this level of government takes a lot of time and often requires high level decisions which affect the play of lower level participants. Additionally, real world commitments may keep the same high level players from part-

icipating in the exercises, further degrading realism. (Perry, 1987:8-9)

The direction a CPX can take in a military exercise can be broken down into two schools of thought. Capt Russ Hall and Lt Col Phillip Miller report that one school maintains CPXs should be "procedural-only" exercises; meaning, only limited and highly controlled elements of realism are allowed as part of the exercise. The reported benefit of this method is the control exercise planners maintain in determining exercise outcome, and in maintaining a degree of latitude in determining what activities will be exercised. The second school of thought maintains that CPXs should embody as much realism as possible without exceeding the limitations and objectives of the exercise. Hall and Miller note both groups do agree that logistics realism must be improved in CPXs. (Hall and Miller, 1990:33)

The purposes of a CPX, to include exercise realism, often vary. Generally though, a CPX should provide a training ground that incorporates the disciplines of strategy, tactics, and logistics together into an integrated whole (Hall, 1989:Ch 1, 6). There is often a tradeoff between logistics realism, and achieving the goals of the exercise. Realism is often lost and the purpose is undermined because the wrong players are used, or over-simplified logistic

inputs are used, or we fail to follow through on logistical limiting factors (Hagel, 1989:Ch 1, 5;Ch 6, 7-8).

These limitations can be overcome. Maj Gregg T. Perry also states that "CPX limitations can be overcome by effective, realistic scenario planning, and staff involvement at all levels (Perry, 1987:9). Another article on the subject, by Maj James D. Gorby says ". . . real world data should be used (when security permits) to reflect actual logistics capabilities and shortfalls (Gorby, 1980:24-30)." Several logistics officers at Air Command and Staff College in 1979 said it was normal during exercises to "'assume the equipment is available and ready.' Consequently, the only thing learned during the exercises was how to fill out reports and use the message center (Gorby, 1980:25)." Though this example is somewhat dated, these same types of assumptions continue to exist in many of our military exercises today. Maj Steven J. Hagel suggests in his Thesis, Realism in Exercises, that we can improve realism by:

1. Having more involvement by our senior level leadership.

2. Using the actual players during the exercise instead of substitutes.

3. Extending the time of the exercise.

4. Conducting more intensive logistic exercises. (Hagel, 1989:Ch 6, 4)

Maj Hagel also suggests the Air Force can improve logistics realism in CPXs by using improved mathematical simulation modeling or realistic databases (Hagel, 1989:-Ch 6, 4).

Several approaches, according to Capt Hall, have been taken to improve CPX reality. An antiquated method for handling aircraft activity used Pareto's principle (the 80/20 rule) (See Stock and Lambert, 1987:419). This method assumed a percentage of the aircraft returned in mission capable condition; the aircraft simply refueled, rearmed and was ready for another mission. The remaining aircraft landed needing repair. This method didn't always identify which system(s) on the aircraft required repair or what parts would be needed to fix the system(s) (Hall, 1989:-Ch 2, 9).

Mathematical simulation modeling, currently in use throughout the Air Force, improves realism considerably. Mathematical modeling, as Capt Hall reports, uses peacetime repair and failure data to determine aircraft availability, aircraft landing status, discrepancy repair times, and repair parts. This method can be expanded to include other logistical activities such as petroleum, oil, lubricant (POL), and munitions requirements (Hall, 1989:Ch 2, 9-10).

A relatively new method, historical databasing, uses near wartime data to manage aircraft availability, determine

aircraft landing status, repair parts needed, and time to repair the aircraft. This method relies on near war-like data in place of peacetime repair and failure rates because of the significant differences that exist with system failures under combat conditions. As reported by Capt Hall, components with high failure rates during peacetime may fail infrequently, if at all, under combat conditions. Likewise, components that fail infrequently during peacetime may fail frequently under combat flying conditions (Hall, 1989:Ch 2, 9-10).

Hall and Miller report that this approach forestalls the question of internal or external validity because actual aircraft discrepancies and parts requirements are derived from near war-like conditions and used in a relatively unaltered state (Hall and Miller, 1990:34).

Hall and Miller also report that several benefits exist that are associated with the use of historical databasing. First, the database is reflective of the real world, and as such, many of the complex real world influences are accounted for automatically. Second, performance, reliability, and maintainability of aircraft systems are reflected within the database. Third, specific supply anl maintenance information is readily available for the user i.e. NSNs, Noun, WUCs, quantity on order, repair times, and discrepancies. Fourth, the database is easily developed and

can be easily modified. Fifth, the database is based on real events, and as such, is easily accepted and used. Sixth, the database is not dependent on computer support for use; therefore, it is quite useful at any forward operating location. Finally, from an exercise planner's point of view, the results from the database can be foreseen. This allows proponents of the procedural-only CPXs to maintain control and anticipate possible logistical shortfalls that may result from the use of the database. (Hall and Miller, 1990:35)

Summary

Military exercises play a crucial role in maintaining strong readiness. They allow us to prepare for war during peacetime. Exercises should be used as an unbiased tool to improve our warfighting capability. In preparing exercises we should look closely at the interrelationship between logistics, strategy, and tactics, in order to match combat capability with sound operational principles. Operators and logisticians need to fully understand the principles by which each other operates, and should try to integrate these principles when planning military exercises. Realism must be an integral part of these exercises so that commanders can develop their warfighting skills under war-like conditions. Realistic military exercises should be designed to

develop the character, intellect, and leadership our commanders will need to be successful in warfare. Logistics realism at the CPX level must echo these desireable conditions. Though heavily laden with simulation, wise use of limiting factors can help overcome the undesirable consequences of simulation with effective, realistic scenario planning, and strong staff involvement. Continued improvements with historical databasing and mathematical modeling techniques should continue to improve realism at the command post exercise level.

Chapter III will discuss the methodology used throughout this research effort.

III. Methodology

Overview

The method outlined in Table 1 will be used to achieve the objective of this thesis. The steps outlined in the table will follow the basic methodology used during the development of the B-52G database model (Hall, 1989:-Ch 3, 1).

TABLE 1

RESEARCH METHODOLOGY

1. Collect data
   a) Procure ETTF ELF-1 mission data
   b) Verify useability of data .
2. Develop KC-135A/E/R database model
   a) Develop database reference tables
   b) Develop practice database reference tables for use with the information guide
3. Develop information guide
4. Develop database evaluation surveys
5. Test KC-135A/E/R database model
6. Conduct field evaluations, observations, and interviews
7. Analyze results

A discussion of the research methodology follows. It will examine the procedure to be used to complete each step of the methodology as outlined in Table 1. For the sake of clarity, steps 4 and 6 will be combined under the sub-heading "Developing and Conducting the Evaluation."

Data Collection

Data collection will involve a two-step process. The first step involves finding an adequate source for the raw data needed to build the database model. To provide as much realism as possible, the data used to develop the KC-135-A/E/R database model should come from a unit whose flying mission closely replicates expected wartime missions. ELF 1 mission data (data collected during support of Saudi Arabian E3 aircraft) from European Tanker Task Force (ETTF) should meet this requirement and is targeted for use in developing the database model.

The second step involves performing verification analysis of the data to determine its usability. The intent here is to insure the data provides the necessary information needed to develop the database model, and to insure the data accurately reflects realistic maintenance conditions.

During the procurement process, the researcher will screen all source data to ensure that it provides sufficient information, and in sufficient quantity, to develop the database model. The source data should include the follow-

ing items: aircraft maintenance landing code, in-flight discrepancies, quantity ordered, work unit code, job control number, national stock number, and nomenclature for the part(s) ordered. To ensure data accuracy, weapon system experts will be used to validate the data.

KC-135A/E/R Database Model Development

Development of the KC-135A/E/R database model will involve the merging of maintenance and supply data elements as depicted in Figure 1.

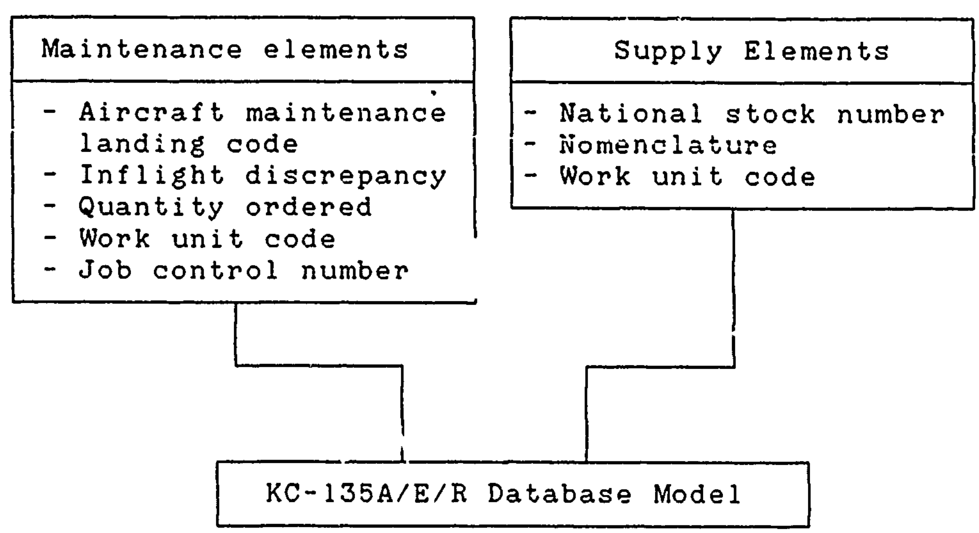


Figure 1. KC-135A/E/R Database Model Source Data Input

The work unit code (WUC) will be used as the key field to link elements of the maintenance and supply databases. The researcher will link the two databases by developing a software program that matches the necessary supply data with the appropriate maintenance data using WRSK listings supplied by SAC headquarters.

A condensed version of the KC-135A/E/R database model will also be developed for training purposes, and will be used with the information guide. The condensed database will simply be a collection of events taken from the KC-135A/E/R database model.

Information Guide Development

The information guide will be a modification of an existing guide developed to support the B-52G Aircraft Maintenance Database Model (Hall, 1989:Ap B). The purpose of the information guide is to provide a standardized method to train and/or familiarize response cell personnel with procedures on how to manage aircraft activities, as well as procedures on how to use the database model during a CPX. Modifications to the information guide will include adjustments for the KC-135 contingency phase inspection, and modification of the time required to perform preflight/thru-flight inspections.

The information guide will consist of detailed, step by step procedures to handle the following items:

1. Aircraft inspections:

    a. Phase inspections
    b. Hourly postflight inspections (HPO)
    c. Preflight/thruflight inspections

2. Supply requirements:

    a. Validating WRSK listings
    b. Parts ordering
    c. Cannibalization
    d. Mission Capability (MICAP) items
    e. Minimum Essential Systems List (MESL) items

3. Documenting exercise forms:

    a. Initial forms set up (STARTEX)
    b. Using the database

4. Handling special cases:

    a. Accounting for aircraft attrition
    b. Additional/replacement aircraft

    (Hall, 1989:Ch 3, 3-4)

Developing and Conducting the Evaluation

A written response survey, interviews and observations will be used to evaluate the effectiveness of the KC-135-A/E/R database model. The researcher will modify an existing survey (Hall, 1989:Ap D) and develop further questions for use during the evaluation phase of the research. CPX response cell members will be evaluated using the survey to test the hypothesis that there is an improved difference in logistics realism between the KC-135A/E/R database model and other mathematical models in use today.

The survey will employ the use of a Likert scale as a means of quantifying responses (See Emory, 1985:255). The

reliability of the survey instrument will be tested using the Cronbach's Coefficient Alpha technique (See Emory, 1985:100). The content validity of the survey instrument will rely on expert opinion to ensure questions are developed that adequately cover the usefulness of the model and its associated training material (See Emory, 1985:95).

The interview will be used primarily to improve the quality of evaluation information by adding to, and clarifying information gathered during the surveying procedure. The interview will focus on capturing the concerns and suggestions response cell personnel may have with using the KC-135A/E/R database model and information guide. The interview method will employ face-to-face interview techniques, with responses recorded in writing (See Emory, 1985:160-169, 178-183).

Observations will be used by the researcher to view first hand how effective the response cell personnel are in using the KC-135A/E/R database model. The observations will be inferential, and variables will be judged qualitatively. Variables for the observation will concentrate on the degree of usefulness each model provides their respective response cell personnel. The researcher shall focus his attention on evaluating several characteristics of the model to include training, ease of use, accuracy, and supportability.

These particular characteristics of the model have been singled out for several reasons. The model must be easy to use and simple to understand. During CPXs little time is provided for training. The response cell personnel generally must take it upon themselves to learn the system they will use during the exercise. If the system is overly complicated, it can lead to confusion, poor performance by response cell members, and inaccurate information passed to decision makers. Consequently, a database model that is easily understood and used, is critical in order to be an effective and reliable tool. The data provided by the model must also be accurate. If not, the credibility of the model is questioned leading to demotivation by the users, and inaccurate information passed up the chain of command. Finally, the model must be supportable, meaning that it must provide the necessary information needed to accurately task the supply system under realistic conditions.

Test KC-135A/E/R Database Model

The KC-135A/E/R database model will be tested during the 1990 Crested Eagle CPX. The exercise will provide the means by which the model's usefulness can be validated. A static group design will be used as the experimental design for the test. Such a design involves administering the database during the CPX and making comparisons between response cells using the KC-135A/E/R Database Model and a

control group of response cells not using the database model. Comparative analysis will then focus on evaluation survey responses from response cell members who have experience in using both the KC-135A/E/R database model and other mathematical models during CPXs. A separate analysis, through survey evaluations, will also be conducted on response cell members that have used only the KC-135A/E/R database model. Specific analysis procedures will be discussed next.

Analysis of Findings and Results

An extensive analysis of the survey evaluations will be conducted comparing the two samples of response cell personnel. The first population will include those personnel with experience in using both the KC-135A/E/R database model and other mathematical models. A statistical analysis of survey evaluations, will be conducted using a studentized paired T-test to determine if there is a difference in logistics realism between the KC-135A/E/R database model and the mathematical model. The second population will include those response cell personnel who have experience in using just the KC-135A/E/R database model. Here a statistical analysis of the survey evaluations will be conducted using the Friedman's non-parametric two way analysis of variance (ANOVA) procedure to determine if there is a significant difference of opinion among users concerning the usefulness

of the KC-135A/E/R database model. A non-parametric procedure should be used if the data variability for the collected data is not equal. Equal variance is a necessary assumption for use of Parametric ANOVA procedures. The Friedman procedure will be used, rather than the Kruskal Wallis procedure, to reduce data variability by blocking the data by the individual questions from the evaluation survey. This process will reduce the within variability of the data thereby increasing the F statistic. Consequently, differences of opinion among respondents will be amplified.

Summary

The research methodology provides a sequential set of steps the researcher will use to progress through the research. Chapter IV will outline the results found from this effort.

IV. Results, Findings, and Analysis

Overview

The methodology outlined in Chapter III was used as a guide for data collection, development of the database model, development of the information guide, and development of the evaluation surveys. Modification, however, had to be made for testing the database model and conducting field evaluations because of the cancellation of the 1990 Crested Eagle CPX.

A suitable alternate CPX was not available to test the database model within the time constraints of the research project. Therefore, a mock exercise was conducted to test the database model using volunteer graduate students from the Air Force Institute of Technology's School of Systems and Logistics. A survey was administered following the termination of the mock exercise to evaluate the database, and information guide. Details of the procedure used; and results, findings, and analysis, will be presented under the headings "Testing the KC-135A/E/R Database Model," and "Evaluations, Observations, and Interviews" later in this chapter.

The results of the methodology will be presented in the same sequence of events as outlined in Table 1 of Chapter III. Data collection will first be discussed followed by development of the database model, development of the infor-

mation guide, development of the evaluation surveys, testing of the database model, evaluation of the database model, and finally, an analysis of the evaluation results.

Data Collection

Data collection was accomplished through a two step process. The first step involved locating an adequate source of data that met the requirements for the database model. Once found, the second step involved validating the data to ensure it provided the realism and accuracy necessary for use in the database model. The detailed explanation of each step will be discussed next.

ELF-1 ETTF mission data (data collected during Saudi Arabian E3 aircraft Tanker Task Force support) was initially targeted for use as source data for the database model. The use of ELF-1 mission data would provide an element of realism that depicted war-like flying conditions that could easily be incorporated into the database model. However, necessary supply data was not available and an alternate source of data had to be found. The next best available source data that depicted war-like flying conditions was that of routine ETTF flying missions. With ETTF mission data, both the maintenance and supply data elements were available and in sufficient quantity to build the database model. Consequently, the ETTF mission data was chosen by

SAC/LGL and this researcher as source data for the KC-135-A/E/R database model.

The source data included the following maintenance and supply database elements (among others):

1. Aircraft/System Maintenance Landing Code
2. Inflight Discrepancies
3. Maintenance Repair Times
4. Repair Parts by:
   a. Work Unit Code (WUC)
   b. Quantity Ordered

The source data did not include associated NSN and Nomenclature (Noun) supply data elements for each required part. However, the remaining supply data elements could be extracted from WRSK listings, the VAMOSC (Visibility in Management of Operating and Support Cost) computer generated support system, as well as through manual research.

The source data was provided by the 11th Strategic Group at RAF Fairford, UK. The data was generated using the PCN SG054-35A Maintenance History Report for on-equipment maintenance, and covers five months of maintenance activity starting 1 June 1989 and ending 31 October 1989.

The source data was initially screened by the researcher and two senior NCOs from the 7th Organizational Maintenance Squadron's Tanker Branch at Carswell AFB to ensure the data was realistic and accurate. Cross checks

were performed randomly to verify that the elements reported in each data field matched the reported maintenance discrepancy. Approximately 30 percent of the database was checked in this manner. Less than five percent of the discrepancies checked contained error. Most of the errors resulted from technicians failing to record the proper WUC for the specific component; most of these errors were accurate to the first three places of the WUC. Consequently, the researcher concluded the source data provided a strong degree of realism and accuracy, and the development of the database model commenced.

KC-135A/E/R Database Model Development

Full Version.

A primary objective of this research effort was to develop a database model that provides information in a realistic form that can be useful to CPX response cell personnel. To be successful, the database model must take the input data from ETTF missions, along with associated supply data, and provide output data for the database model that will ensure full realism was preserved.

To develop the database model, source data elements had to be merged with NSNs to make the database model complete. A six step process was used to fully develop the model.

The first step involved developing a format for the database model, and selecting a software package to support

it. To maintain consistency and standardization, a format duplicating that of the B-52G Historical Database Model was used. By maintaining a high degree of consistency and standardization, response cell personnel familiar with one historical database model can easily transition to another model with little or no difficulty resulting from the format of the database model. With the format set, a spreadsheet software, QUATTRO version 1.2, was selected. This particular software package was selected primarily because of its ease of use, and availability.

In step two of the development process, maintenance and supply elements from the source data were manually extracted from the Maintenance History Report and placed in a QUATTRO data file. The elements extracted for the maintenance history report included:

1. Aircraft/System Maintenance Landing Code
2. Inflight Discrepancies
3. Maintenance Repair Times
4. Repair Parts by:
    a. WUC
    b. Quantity Ordered

Once complete, the NSN had to be linked with the associated WUC from the maintenance history report and placed in the QUATTRO data file.

Step three involved performing the linking process. This process turned out to be rather long and laborious. A portion of the required linking was accomplished using WRSK data files supplied by HQ SAC/LGSMO. WUCs were extracted from the QUATTRO data file and placed in a DBASE III+ file along with the WRSK data. A DBASE III+ program was written to search the WRSK data for a matching WUC and link the WUC to the NSN. Once complete, the new file was imported back into the QUATTRO data file.

Not all WUCs could be linked using this process though. A computer software support system called VAMOSC was used to link 70 WUCs with NSNs. The VAMOSC system is a support system under the control of HQ AFLCs Cost Accounting Directorate (AFLC/ACC). Though used for cost accounting purposes, the VAMOSC system has the capability of cross referencing a WUC for the KC-135 aircraft with its associated NSN and Noun.

Even after using the VAMOSC system, 17 additional WUCs had to be manually researched. Once the research was complete, the collected WUCs and matching NSNs from both the VAMOSC system and through manual research were entered into the QUATTRO data file.

Step four involved the simple process of assigning maintenance event control numbers to the database elements in the data file. The database elements associated with an

individual sortie were grouped together and a maintenance event control number was assigned to identify each sortie.

Step five in the final preparation of the database model development involved the deletion of unnecessary records from the data file. The only records deleted from the data file were those that did not contribute to the purpose of the database design. These records were classified as insignificant, minor discrepancies, requiring no parts, and that did not impair or degrade from the mission of the aircraft.

The final step for the development of the database model development involved identifying the overall fix time for a sortie having a Code 3 discrepancy and placing an asterisk in the adjacent LNDG CODE column. With this final step to the data file finished, the database model was ready for testing.

The completed KC-135A/E/R Aircraft Maintenance Logistics Database is located in Appendix A. The columns of the database, as defined by Capt Hall, follows:

> Maintenance Event Control Number - The control number is used to identify a 'maintenance event' for a particular aircraft on the CPX MX Worksheets 1 and 2. A maintenance event includes all the lines of discrepancies in the database associated with an aircraft

landing from a sortie. It also provides a means of record keeping for later analysis.

Acft T.N. - The aircraft tail number to which the maintenance event is assigned is entered in this column (by the user).

Lndg Code - Identifies the maintenance condition of an aircraft returning from a mission.

Code 1: Aircraft/system(s) fully operational. Aircraft is landing with no known discrepancies which would adversely affect performance of the aircraft/system(s).

Code 2: Aircraft/system(s) having minor discrepancies which may affect operating performance but will generally not preclude the aircraft from flying another mission prior to repair.

Code 3: Aircraft/system(s) having discrepancies which render the aircraft and/or system(s) unusable. Generally, aircraft are not flown until Code 3 discrepancies are repaired.

Fix Time - The time needed to repair a discrepancy listed in the database. The times listed do not include normal refuel, phase, HPO, preflight/thruflight or inspections. (Time in hours to the nearest tenth). The overall aircraft fix time is identified by an asterisk in the Lndg Code column when an aircraft has Code 3 discrepancies.

NSN - The national stock number (NSN) of the needed repair parts.

Noun - The nomenclature of the needed repair part.

WUC - The work unit Code (WUC) identifies a major repair part, system or subsystem.

Qty - Quantity of repair part(s), if needed.

In WRSK - For the user to identify if the repair part is available in the WRSK (Yes/No).

MESL - For the user to identify whether the affected system is on the minimum essential systems list (MESL) in AFR 65-110, SAC Supplement 1, if the part is not on-hand (Yes/No).

Msg DTG - For the user to record the date-time-group of the message requesting a part not available in the WRSK.

Remarks - To provide a short, general description of the discrepancy associated with each record. (Hall, 1989:Ch 4, 9-11)

The database model incorporates a high degree of internal and external validity. Capt Hall's elaboration of the inherent validity strengths of historical database models are fully supported by and incorporated into this database model. He argues that the method used to develop historical database models forestalls any question of either internal or external validity because actual aircraft discrepancies and part requirements are used in a relatively unaltered state. The historical database model uses data from actual aircraft flying missions. Additionally, internal validity can be confirmed by ensuring exact one to one relationships as database fields are joined and through follow-up verification checks of all fields within each record in the database. (Hall, 1989:Ch 4, 12)

Practice Database.

A condensed version of the database model was developed for use with the information guide solely for training purposes. Once the full version was complete, a practice database was built by extracting a small number of maintenance events and placing them together in a separate database file. The maintenance events selected present a broad variation of discrepancies to response cell personnel during their pre-exercise training session. This will allow enhanced training by providing response cell personnel an opportunity to view the data before hand, so that questions concerning the database model may be asked. The Practice Database is located in Appendix C.

A set of training slides have also been developed to enhance the training process. Some of the slides were duplicated from the B-52G Historical Aircraft Maintenance Database Model and modified to support the KC-135A/E/R Database (See Hall, 1989:Ap F). The training slides are located in Appendix F.

Information Guide

An information guide is needed as documentation to provide clear and concise procedures and training on how to manage aircraft activities, and how to use the database model.

The information guide is a replication of the one used with the B-52G Aircraft Maintenance Database Model (See Hall, 1989:Ap B). Modifications to the content have been made to accommodate the KC-135A/E/R aircraft. These modifications include adjustments for the KC-135 contingency phase inspection, and modification of the preflight/thruflight inspection time requirement.

The information guide is designed to provide the user with a set of practical requirements in a set of procedures that are easily understood, and in a format that allows quick access to the information. The guide is also arranged in an order that coincides with expected pre-exercise training sessions.

The procedures outlined in the information guide are based on current aircraft maintenance requirements, and current supply procedures as directed by SAC regulation and appropriate technical data (as of this writing). The specific procedures cover the following areas:

1. Aircraft inspections:

   a. The purpose, frequency, and how to handle the phase inspections.
   b. The purpose, frequency, and how to handle the hourly postflight (HPO) inspections.
   c. Accounting for aircraft preflight/thruflight inspections.

2. Aircraft parts requirements:

   a. Checking the WRSK listing for available parts.
   b. Ordering of parts.

c. Interpreting the Minimum Essential System List (MESL) in AFR 65-110, SAC Supplement 1.
d. Handling cannibalization of MICAP parts.

3. Documentation of exercise forms:

   a. Initial setup of forms at the start of the exercise (STARTEX).
   b. Extracting maintenance events from the database and plotting the data.

4. Handling special cases:

   a. Dealing with late takeoffs, maintenance cancellations.
   b. Accounting for ground or airborne attrition of aircraft.
   c. Incorporating additional/replacement aircraft in the flow of events.
   d. Handling of aircraft diverted from other locations. (Hall, 1989:Ch 4, 12-13)

The completed KC-135A/E/R Database Model Information Guide is located in Appendix B.

Evaluation Survey Development

Two written response surveys were used to evaluate the effectiveness of the KC-135A/E/R database model. The surveys were designed to test the hypothesis that the KC-135-A/E/R database model improves logistics realism in CPXs, and that the database model is easy to use.

Two survey instruments were needed to accommodate the two population groups to be sampled (See Appendix E). The first evaluation survey, titled "KC-135A/E/R Aircraft Maintenance Logistics Database Evaluation, Evaluation Survey 1," was administered to all personnel participating in the mock exercise. With this group, the survey instrument was de-

signed to allow comparisons of opinion among respondents with respect to the test hypothesis. That is, the results would help answer the question "does the database model provide realistic logistical information to the response cell member?". With the sample population having no previous CPX experience, they are not capable of making a judgement on whether the database model improves realism over existing models currently in use. Therefore, a second survey instrument, titled "Evaluation 2, Previous Experience in CPX," was needed to evaluate those personnel who have had previous experience as a response cell member so that a comparison of improved realism can be made between the database model and other models currently in use.

Both evaluation surveys were developed using a five point Likert scale to quantify responses. Three constructs were used as a basis for developing questions in the surveys. The first construct asked questions to determine if the database model is realistic. Questions 1 and 5 in the first evaluation survey, and questions 1 and 4 in the second evaluation survey were used in support of the first construct. The second construct asked questions to determine if the database model was easy to use. Questions 2, 3, 4, 6, and 7, of Evaluation Survey 1, and questions 2, 3, 5, 6, and 7 of Evaluation Survey 2 were used in support of the second construct. The third construct asked questions to determine the usefulness of the information guide. Ques-

tions 9 and 10 of the first survey, and question 8 of the second survey were used in support of the third construct.

Many of the questions used in both surveys were modified from an existing survey used to evaluate the B-52G database model. The B-52G survey was used because it provided a fairly high measure of consistency in its ability to measure the usefulness of the B-52G Database Model. To make this claim, a test of the B-52G evaluation survey's reliability was conducted by this researcher to determine its internal consistency. A Cronbach's coefficient alpha of .7985 was computed using the SPSS-X mainframe statistical software package. Based on these findings, the researcher concluded the B-52G Model's evaluation survey provided a fair degree of internal consistency and would therefore be a useful guide toward the development of the two evaluation surveys for this research effort.

Testing the KC-135A/E/R Database Model

The KC-135A/E/R Database Model was tested during a mock exercise held at the Air Force Institute of Technology's School of Systems and Logistics on 20 April 1990. Its purpose was to validate the model's usefulness by determining if the model met the objectives of this research effort; namely, to provide improved logistical realism for response cell members during a CPX.

In validating the model, three specific constructs were tested. First and foremost, the element of realism was

tested. Realistic tasking orders were used by each response cell team to launch, recover, and maintain their fleet of aircraft throughout the exercise. Second, ease of use of the database, CPX maintenance worksheets, and information guide were tested. A highly compressed time line was used to artificially induce time constraints on the response cell team members during the exercise. If the database and its associated material were difficult to use, this would be amplified under an artificially induced time constraint. Finally, the need for minimal training was tested. Each team was provided a copy of the Information Guide to read four days prior to the beginning of the exercise. Additionally, a one hour training session was provided just prior to the start of the exercise to ensure each member was somewhat familiar with their responsibilities. The need for minimal training is considered critical to the success of the model. Typically, only minimal training is provided to response cell personnel prior to accomplishing their duties as a response cell member. The model and its associated documentation should provide enough information, as stand alone documents, so response cell members can understand and use the database model effectively during an exercise.

Composition of the Mock Exercise.

A total of thirteen Officers from the School of Systems and Logistics volunteered to participate as response cell members during the mock exercise. Each, from their respective backgrounds, provided a unique perspective to the exercise. The thirteen volunteers consisted of one rated navigator, two logistics planners and ten aircraft maintenance officers.

The mock exercise was composed of five teams each containing two or three personnel. Each team was assigned either 7, 9, 11, 13, or 15 aircraft as the primary number of aircraft assigned (PAA) under their control. Each aircraft was assigned fabricated tail numbers and total airframe flying hours. Each team was assigned a specific set of maintenance event control numbers (from the database) for use during the exercise. This would allow the team members to collectively sample a broader portion of the database model during the exercise than would otherwise be sampled if they had all started from the same point. Additionally, teams 1 and 2 used the WRSK listing designed to support a deployment of 10 aircraft, while teams 3, 4 and 5 used the WRSK listing supporting a deployment of 15 aircraft.

The exercise covered a 48 hour period of time compressed into four hours of actual exercise play. Each team received two tasking orders during the exercise (See Appendix G). The tasking orders were designed to realistically

reflect demands placed on a response cell during a CPX. Finally, the researcher acted as the exercise coordinator and exercise controller. He determined when necessary mission capable (MICAP) parts and routine refill of the WRSK were received. His purpose was to duplicate the communication and coordination processes that would typically exist between the regional Logistic Readiness Center (LRC) and the response cells.

Table 2 provides a synopsis of specific team composition and assignments used throughout the exercise.

TABLE 2

MOCK EXERCISE TEAM COMPOSITION AND ASSIGNMENTS

	# of Personnel on Team	Primary Aircraft Assigned	Maint. Event Control # Used	WRSK list Used
Team 1	2	7	300 - 359	10
Team 2	2	9	225 - 299	10
Team 3	3	11	150 - 224	15
Team 4	3	13	075 - 149	15
Team 5	3	15	001 - 074	15

Worksheets were used by each team to track their progress through the exercise. The worksheets are the same as

those developed by Capt Hall for the B-52G Database Model (See Hall, 1989:Ap E), and are located in Appendix D.

The objective for each team was to maintain their fleet of aircraft in the highest state of readiness possible while fulfilling the tasking orders levied upon them by CPX headquarters.

Evaluation Survey 1 Results.

At the completion of the mock exercise each participant completed the KC-135 Aircraft Maintenance Logistics Database Evaluation (Evaluation Survey 1). Those personnel who, at some previous time in their career, had participated as a CPX response cell member also completed a second Evaluation Survey (Evaluation Survey 2) (See Appendix E).

The results of Evaluation Survey 1 will be presented first. Each question will be listed along with summary statistics and associated comments made by each respondent.

---

1. ______ The database helped make exercise play in the response cell more realistic.

Strongly agree	Tend to agree	Can't agree or disagree	Tend to disagree	Strongly disagree
1	2	3	4	5
I K	A D E F G H J M	B L	C	
Total Responses = 13		Mean = 2.15		Stdrd Dev = .80

Why or how?

A. (no comment)

B. "I really don't have anything to compare with."

C. "Everything was Code 2 and used parts only once."

D. "Having realistic MX breaks to fix times lends credibility."

E. "Actual maintenance discrepancies easy to relate to real world."

F. "Conditions realistic, especially parts availability."

G. "We need a scenario to go by."

H. "Knowing the status of the acft on landing allowed some gaming prior to filling line."

I. "Provided factual times for maint. actions that made you take the required amount of time to complete. It doesn't allow you to cheat."

J. "Good format for depicting MX and supply events."

K. "Provided the core for maintenance involvement."

L. "Because I have no experience with tankers I don't have any feeling for how realistic the database really was."

M. (no comment)

2. ______ The database makes it easy to get the information I need to plot aircraft maintenance actions, inspections, and turn times.

Strongly agree	Tend to agree	Can't agree or disagree	Tend to disagree	Strongly disagree
1	2	3	4	5
A F G I J K L	B C D H	E		
Total Responses = 12	Mean = 1.50		Stdrd Dev = .67	

Why or how?

A. "You have real world info instead of simulated times."

B. (no comment)

C. "It's unknown as to whether supply support was realistically tasked."

D. (no comment)

E. "Nothing to compare it with."

F. "All needed info available."

G. (no comment)

H. "Everything important to the exercise was readily available."

I. All actions had easily understood times that were readily available."

J. "MX hours well depicted."

K. "You might add blank lines where inputs should be written in the database (tail number)."

L. "Exceptionally easy to use. I originally thought the time compression would be a real limiting factor. In the end we could have handled 2-3 times our tasking (9 PAA)."

M. (Participant did not respond to this question)

3. ______ The database makes it easy to get the information I need to determine the availability of each aircraft.

Strongly agree	Tend to agree	Can't agree or disagree	Tend to disagree	Strongly disagree
1	2	3	4	5
B F G I J K	A D H L M		E	C

Total Responses = 13	Mean = 1.92	Stdrd Dev = 1.26

Why or how?

A. "Once you place a maint. event control number with an aircraft you can better determine its availability."

B. "I can quickly determine availability."

C. "All the necessary info was given to develop a flow schedule."

D. (no comment)

E. "This info comes from the CPX worksheets."

F. "Database with background knowledge made this task easy."

G. (no comment)

H. (no comment)

I. "Condition codes of aircraft and the discrepancies were clear enough to determine if the acft was able to make its mission."

J. "By identifying type (Code) of discrepancy and mean maintenance time (MMT)."

K. "Clearly specified."

L. "My lack of tanker experience made me guess on a few aircraft availability times, but in general, if this were a fighter database the info would have been more than sufficient and my answer would be a 'Strongly Agree'."

M. (no comment)

---

4. ______ The database makes it easy for me to determine what repair parts I need when an aircraft lands.

Strongly agree	Tend to agree	Can't agree or disagree	Tend to disagree	Strongly disagree
1	2	3	4	5
ABDEFGH IJKLM		C		
Total Responses = 13		Mean = 1.15		Stdrd Dev = .55

Why or how?

A. "We had the parts actually used to fix the aircraft."

B. "The MECN made it quite clear what parts were required."

C. (no comment)

D. "Specific description of problems."

E. "The info is readily available."

F. "Sure, the MDC would increase availability of parts."

G. (no comment)

H. (no comment)

I. "Yes, it tells me exactly what part I need."

J. "Very realistic. All the input data is there."

K. "Clearly specified."

L. "Very easy to use, almost instant understanding of the format."

M. "NSNs provided."

---

5. ______ Having the discrepancy associated with a given part requirement helped make the demands more realistic.

Strongly agree	Tend to agree	Can't agree or disagree	Tend to disagree	Strongly disagree
1	2	3	4	5
A D J K L	B E F G H I	C M		
Total Responses = 13	Mean = 1.77		Stdrd Dev = .73	

Why or how?

A. (no comment)

B. (no comment)

C. "It's unknown whether this is true because can't assess whether demands are realistic for this aircraft."

D. "Same as # 1 [Having realistic MX breaks to fix times lends credibility.]."

E. "Shows the relation between the write-up and the parts required."

F. "Tends to be more of a learning tool for those that don't know."

G. (no comment)

H. "In this scenario, the discrepancy was not really a player."

I. (no comment)

J. "Having a part levied against the downtime, or vice versa, provides credibility."

K. "Would help in judging the condition of the A/C."

L. "Absolutely - if I was provided the part requirement only, I would be providing a total guess, the discrepancy is very helpful."

M. (no comment)

---

6. ______ Having the noun and work unit code associated with the national stock number for a needed part helped me locate the part in the WRSK listing and more easily identify the item in message traffic.

Strongly agree	Tend to agree	Can't agree or disagree	Tend to disagree	Strongly disagree
1	2	3	4	5
I L	H K	A G	J	B C D E F M
Total Responses = 13		Mean = 3.53		Stdrd Dev = 1.61

Why or how?

A. "The NOUN did not help in the WRSK listing- the WUC did, unless the part was not listed with WUC - having the ability to sort the

WRSK listing by NSN would make parts much easier to find."

B. "We still had to check every stock number. The WUC didn't match the stock number."

C. "The WRSK list needs to be sequenced by NSN."

D. "NSN and WUC didn't help on this particular exercise because of the WRSK listing format."

E. "WUC didn't help at all with the WRSK. The NOUN was not available in the WRSK listing. May have helped in messages."

F. "NSN need to be ordered, nomenclature should be included."

G. "NOUN wasn't available in WRSK listing. It would have been helpful."

H. "In this case, no. If listing were aligned in WUC order then yes - would recommend in NSN order."

I. "Would have if I used listing right. However, the proper way to use the list needs to be stressed to those who will be using it. Also, the info needs to be sorted by WUC, NSN."

J. "We didn't know that the WUC grouped everything together. An oversight on our part."

K. "Need to stress WUC as a way of finding the NSN. NSN or WUC need to be in sequential order."

L. "We searched the NOUN and WUC columns first."

M. "We did not find any WUCs in the listing."

---

7. ______ Having the noun and work unit code associated with the national stock number for a needed part helped me determine whether a part was essential to fly a given mission and track cannibalizations.

Strongly agree	Tend to agree	Can't agree or disagree	Tend to disagree	Strongly disagree
1	2	3	4	5
	D E F G H	A B C	I J K L	M
Total Responses = 13		Mean = 3.08		Stdrd Dev = 1.04

Why or how?

A. "Never really came into play - used the WUC to check the MESL on two items."

B. "In our scenario we only needed one part, and it was a Code 2 write-up."

C. "Did not use the MESL."

D. "Helped relate to the MESL."

E. "Made checking the MESL easy having the NOUN the WUC was used in tracking CANN parts."

F. "Background and MESL also helped."

G. "WUC was needed to cross reference to MESL. We tracked CANNs on CPX MX worksheet."

H. "Again, not in this case - but if a CANN log were MX, then yes."

I. "The NOUN and NSN don't tell me if the part is critical."

J. "The landing code tells me if the part is important or not. We didn't have CANNs so it was difficult to test this. Additionally, I can't remember having seen the tracking of CANNs in the book."

K. "Doesn't help track cannibalizations. WUC not overly useful."

L. "Made no difference. Our decision on part essentialability had nothing to do with NOUN

and WUC availability. We did not accomplish any CANNs."

M. "Unfamiliar with the part redundancy within the aircraft."

---

8. ______ The CPX MX Worksheets along with the new symbols and charting technique streamlined the tracking of each aircraft's flying and maintenance requirements.

Strongly agree	Tend to agree	Can't agree or disagree	Tend to disagree	Strongly disagree
1	2	3	4	5
I J K	A B D E G H L	C F M		
Total Responses = 13		Mean = 2.00		Stdrd Dev = .71

Why or how?

A. "Easy to work with and understand. Tracking all the numbers make the sheets very cluttered. Some symbol other than just "maint" would be useful for tracking maint."

B. "The symbols made it easier to track aircraft."

C. "I've never done this before so I can't say whether it's an improvement or not."

D. "As long as it's standardized it really didn't matter much what the symbols were."

E. "Nothing to compare with, but it did seem to flow smoothly after training familiarization."

F. "Another team member used CPX MX worksheets, he didn't seem to experience any problems."

G. "No method specified for CANNs. Had just enough room without tracking refueling points."

H. "Everything important to the exercise was readily available."

I. "Was easy to understand and follow."

J. "Gave a good standardized format. Needs to have two horizontal lines per mission."

K. "Standardized symbols helped. Should carry-over maintenance be included on the work-sheets?"

L. "It was very easy to chart but I don't know why we tracked ARCT and fuel loads."

M. "I don't know how it was done before."

---

9. ______ Working with the practice data base and other training materials adequately prepared me for using the database during the exercise.

Strongly agree	Tend to agree	Can't agree or disagree	Tend to disagree	Strongly disagree
1	2	3	4	5
G H L	A B C D F I J K M		E	
Total Responses = 13		Mean = 1.92		Stdrd Dev = .76

Why or how?

A. "Helped me to quickly become familiar with info."

B. "The example prior to STARTEX was sufficient."

C. (no comment)

D. "Gave me a feel for how all the documents fit together."

E. "Not enough time was available during training but having some additional time at the beginning of STARTEX helped."

F. "Operations ran very smoothly, no problems."

G. (no comment)

H. (no comment)

I. "It gave me some practical experience."

J. "Practice makes perfect. Training on the rest of the MESL (or its importance) would have even been fine."

K. "We were rushed in our classroom training."

L. "Yes - the short training session and your availability in the early exercise phase provided excellent preparation."

M. "It helped explain what I wasn't sure of by just reading the book."

---

10. ______ The information guide helped me understand my job in the response cell and answered the questions I had.

Strongly agree	Tend to agree	Can't agree or disagree	Tend to disagree	Strongly disagree
1	2	3	4	5
A H I J	B C F G K L M	D		E
Total Responses = 13		Mean = 2.00		Stdrd Dev = 1.08

Why or how?

a. What information was not provided that would have been helpful?

b. What information was provided that was not useful or helpful?

A. "Well put together - contains the needed info for completing the response cell requirements."

B. "Along with the intro prior to STARTEX."

C. "See comments in the Guide."

D. "I didn't get it in time to read it fully."

E. "After thoroughly studying the guide (read through two or more times) it covered everything quite well."

"Better description of how Code 2's could be handled - parts use, cancelled maintenance."

"Fuel loads and ARCT times were not used."

F. "Briefing was more helpful."

G. "Info on tracking Code 2s could have been more specific."

"The ability to look ahead to determine landing codes before takeoff detracted from realism. Phase and HPO hours should be tracked descending rather than ascending. A brief write-up on concept of maintenance for the airframe would have been helpful i.e. preflights immediately before flight instead of on swings. Phase theory - hours versus days."

H. (no comment)

I. "The 'NUTSHELLs' in the book were great!"

J. "The recaps (NUTSHELLs) were a valuable aid during the exercise."

K. "The in a NUTSHELL sections were very useful. You might put them in an implementation checklist or appendix."

"Emphasis needs to be placed on not accomplishing tasks before possible. (i.e. follow exercise times realistically.)"

L. "The guide and the training session prepared me adequately. Either tool standing alone would not have been sufficient in the time we had available."

"I was confused on the concurrency of MX actions."

M. "It helped me (even though I only had limited time to review it prior to the exercise)."

"Parts list in NSN sequence."

"WUC Codes."

"We should not have been given A/C status until it returned. (possibly in a sealed envelope)"

Evaluation Survey 1 provided a fairly high measure of internal consistency in its ability to measure the usefulness of the KC-135 Database Model. A Cronbach's coefficient alpha of .7561 was measured for Evaluation Survey 1.

Analysis of Findings and Results.

Non-statistical Analysis.

A non-statistical analysis of the research design, and of the data collected, was performed to identify trends or possible inconsistencies with the data that confuse, cause

disorder, or otherwise prevent a clear understanding of the data results. The collected data must be as free as possible from confounds so that correct conclusions can be inferred from its results. For this data set, confounds were caused by the experimental design, to include the environment the test was conducted in, and by the personnel used in testing of the database model.

An optimal environment to test the database model would have been during an actual CPX where personnel, familiar with the aircraft, would have been deployed at forward operating locations. Though this environment would have presented its own set of confounds, it would have provided a truer picture of the database model's useability. This should occur, primarily, because the environment for which the database model is intended to be used would be in place, along with personnel qualified to act as response cell members.

Unfortunately, a CPX was not available for the testing of the database model. The next best option available to the researcher, in the time allotted for completion of the research effort, was to conduct a "Mock" exercise to test the database model. This would be done by simulating a CPX environment at AFIT using volunteer graduate students to run the database model. On a scale of desirability, where a

test of the database model using a CPX would rate a top score of 10, a mock exercise only rates a three.

A mock exercise is not as desireable as a CPX to test the database model for several reasons. A large number of artificially induced confounds exist with a mock exercise that could adversely bias, taint, or skew the test results.

Duplication of the CPX environment is one such example. The majority of the volunteers, as well as this researcher, have had no previous exposure to the CPX environment. It is therefore difficult to capture those elements of purpose that exist in a CPX where the mission, objectives, scope, and overall limitations of the exercise are understood. To reduce this confound in the mock exercise, the researcher conducted extensive informal interviews with several personnel knowledgeable of CPXs to gain an understanding of how a CPX, at the response cell level, is conducted.

Another confound that can effect the data was the amount of time the volunteers could devote to the mock exercise. Due to the academic pressures of a full course load plus thesis research, volunteers were only asked to devote half a day to this research effort. Therefore, the researcher elected to compress 48 hours of actual CPX play into four hours of mock exercise play. To reduce the possible effects of this confound, only essential exercise inputs were given to the personnel so that their efforts

could remain focused on testing the database model during the entire four hours of exercise play.

Still another confound that can effect the data results revolve around the backgrounds of the volunteers. Three considerations come into play here. First, a narrow point of view with evaluating the database model may be present. Ten of the 13 volunteers are aircraft maintenance officers. Some may evaluate the database model from a purely maintenance point of view without regard for broader logistical considerations the model can have in support of the overall mission.

Second, eleven of the 13 volunteers have had no previous experience with CPXs. Therefore, they have no frame of reference to draw from to understand how the many parts of the exercise fit together as a whole. They may therefore be limited in understanding the overall impact, complexities, and interdisciplinary relationships that must exist between logistical support and operational requirements needed to meet mission taskings. To further expand this point, a converse side may also exist. The two volunteers who had previous experience as response cell members, had that experience in a tactical environment. There may be enough of a difference in CPX procedures among the major commands to cause possible bias in how this database model was evaluated. Preconceived expectations may not have been satisfied with the mock exercise that would have normally

occurred in a tactical CPX. Little can be done to counter this confound except recognizing that it exists, and recruiting personnel with experience or with a compatible background to those personnel typically used in CPXs. The researcher made every effort to ensure this confound was minimized.

The third and most important possible confound relating to the background of the volunteers is that none of the personnel had any experience with the KC-135 aircraft. Both from an operations point of view and from a maintenance point of view it would be difficult to evaluate the usefulness of the database model without having some KC-135 aircraft background.

An important next step was to carefully scrutinize the respondent's comments. Many of the confounds previously identified were evident in the comments made by the respondents. Additionally, analysis of the comments identified further confounds that may have tainted the test results.

The most noted problem, identified by 7 of the 13 respondents, dealt with the format of the WRSK supply listing. The respondents had difficulty determining if a needed part was available in supply because the WRSK listing was not sorted by NSN or WUC. This forced the respondents to search through each page of the WRSK listing to determine if the needed part was available. Though the WRSK listing is not part of the database model itself, it is a necessary

tool to monitor consumption data for supply parts. Unfortunately, the data results of question six reflect this problem thereby severely tainting the overall evaluation of the database model.

A second problem, identified by five respondents, deals with the inherent design of the database model. Because the entire database is available to response cell members at the beginning of an exercise, "gaming" can result. That is, response cell members can determine, ahead of time, what their future needs will be. If not controlled at the response cell level, exercise realism can be seriously effected. The supply system can be unjustly tasked through the requisition of parts not yet needed, which will lead to inflated aircraft availability.

The third problem, identified by four respondents, supports an earlier identified confound of the mock exercise. Namely, the respondents had no previous CPX experience they could use for comparison against this database model. Without prior CPX experience, it was difficult to make an objective evaluation. Clearer stated evaluation objectives could have reduced this confound somewhat.

Other comments made by the respondents that supported or identified possible confounds included lack of experience with the aircraft (3 comments), unfamiliar with exercise procedures (2 comments), and not understanding the question (1 comment).

Several comments were hard to interpret. Five comments did not make any sense what-so-ever with respect to the question being asked. This may have resulted from an unclear understanding of the question. Another comment was made that was inconsistent with the respondent's numerical response for that question. This may be attributed to a miss-mark by the respondent, or, as stated earlier, an unclear understanding of the question being asked.

Finally, a single comment was made concerning the unrealistically low number of Code 3 discrepancies identified in the database. Though this comment supports an earlier identified confound stemming from unfamiliarity with the aircraft, it is nevertheless a comment worth investigating.

During the development phase of the database model, the researcher had also identified an abnormally low number of Code 3 discrepancies present in the source data. At present the researcher has been unable to pin point the exact cause. The data does not appear abnormal to the maintenance experts who reviewed the raw data. The experts argue that aircraft typically deployed to support ETTF requirements tend to have fewer Code 3 discrepancies. Though this appears to be the case with this database model, the researcher has been unable to confirm or disprove this argument.

A second concern with the database model is reflected in the dramatic decrease in the number of discrepancies per aircraft and an associated decrease in the number of parts replaced. Figure 2, Graph 1, shows the number of parts replaced every 50 sorties flown. From this graph it

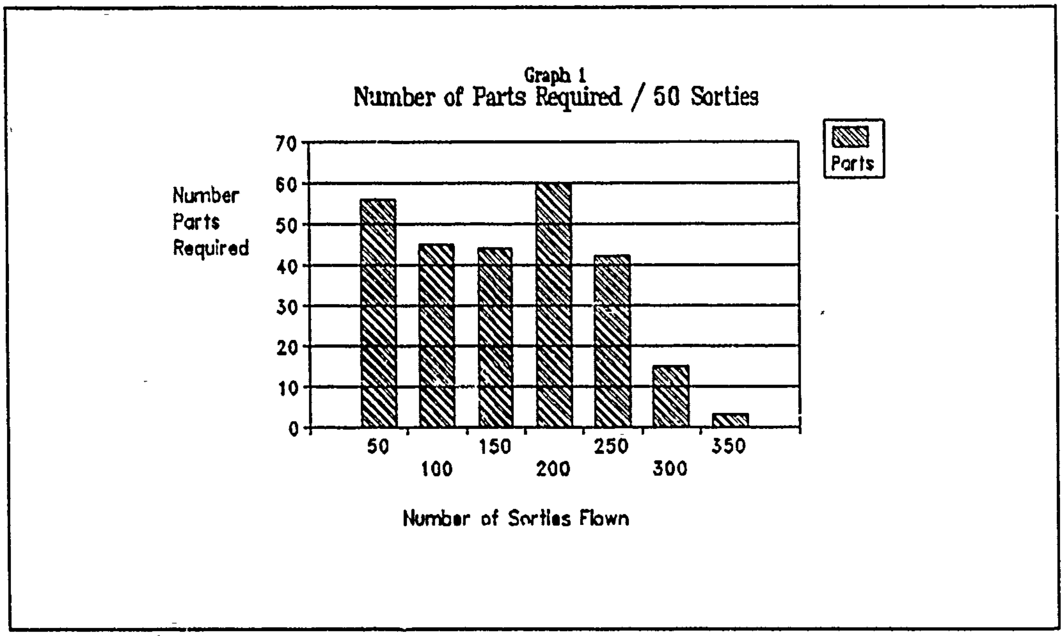
ing has occurred to effect the number

r the five months the ETTF data covers.

on in parts consumed may be partially explained by an apparent decrease in the number of discrepancies reported.

Figure 2, Graph 2, shows the relationship between the total number of discrepancies reported per every 50 sorties flown and the number of parts replaced for each of those 50 sorties. As would be expected, as the total number of discrepancies decrease, the parts consumption should decrease as well; however, as Graph 2 shows, parts consumption drops sharply in relation to the decreased number of discrepancies. The researcher believes some other event, besides a decrease in discrepancies, has occurred to cause the sharp drop in parts consumption. As yet, the researcher has been unable to isolate the cause.

With the non-statistical analysis of the data complete, it is now necessary to perform statistical analysis.



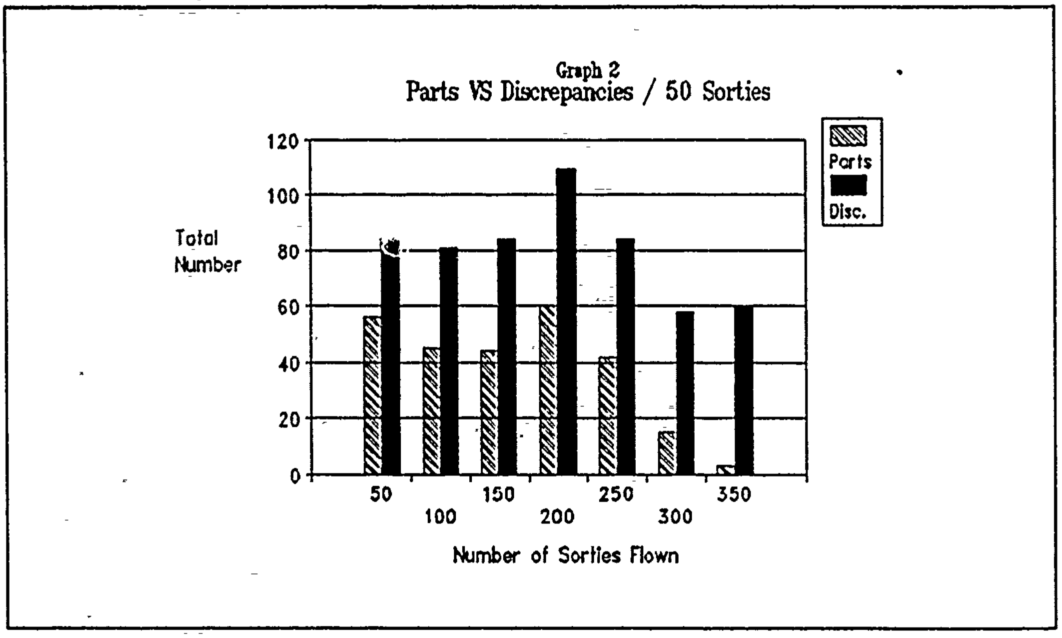


Figure 2. Graphical Comparison of Parts/Discrepancies From ETTF Source Data

Statistical Analysis.

Statistical analysis will be performed using STATISTIX II, An Interactive Statistical Analysis Program for Micro-computers, by NH Analytical Software.

Identifying Confounds.

Several steps were taken during the analysis to statistically identify outliers caused by confounds within the data. Outliers are those possibly faulty extreme measurements that stand out from the rest of the data (McClave and Benson, 1988:126). Outliers can taint or skew the data causing erroneous results when analyzed.

A first step in the analysis was to review the raw data. Table 3 shows the raw data in a form easily used for comparison. The vertical axis corresponds to each of the questions from Evaluation Survey 1 found in Appendix E. The horizontal axis corresponds to each of the 13 respondents. Each coordinate represents the numerical value from the likert scale the respondent chose in response to the associated question. Descriptive statistics for the data is provided in Table 4. Here, the calculated mean and standard deviation are displayed, along with the sample size for each respondent's associated probability distribution.

A missing data value is present in this data as indicated in Table 3. The Friedman non-parametric ANOVA procedure, a statistical procedure that will be used in

later data analysis, does not allow for missing data. Therefore, to overcome this obstacle without affecting the procedure's results, the respondent's probability distribution mean value of 2.5 will be substituted and used for all statistical calculations.

TABLE 3

EVALUATION SURVEY 1

RAW DATA MATRIX

Respondents (Treatment)

(Block) Quest.	A	B	C	D	E	F	G	H	I	J	K	L	M
1	3	2	4	2	2	2	2	2	1	2	1	3	2
2	2	1	2	2	3	1	1	2	1	1	1	1	*
3	1	2	5	2	4	1	1	2	1	1	1	2	2
4	1	1	3	1	1	1	1	1	1	1	1	1	1
5	1	1	3	1	2	2	2	2	2	1	1	1	3
6	5	3	5	5	5	5	3	2	1	4	2	1	5
7	3	3	3	2	2	2	2	2	4	4	4	4	5
8	2	2	3	2	2	3	2	2	1	1	1	2	3
9	2	2	2	2	4	2	1	1	2	2	2	1	2
10	2	1	2	3	5	2	2	1	1	1	2	2	2

* Missing data value.

TABLE 4

DESCRIPTIVE STATISTICS

EVALUATION SURVEY 1 DATA

Respondents	Sample Size	Mean	Standard Deviation
A	10	2.20	1.229
B	10	1.80	0.788
C	10	3.20	1.135
D	10	2.20	1.135
E	10	3.00	1.414
F	10	2.10	1.197
G	10	1.70	0.675
H	10	1.70	0.483
I	10	1.50	0.972
J	10	1.80	1.229
K	10	1.60	0.966
L	10	1.80	1.033
M	9 *	2.50	1.310

* Missing data value

Box and Whisker plots, shown in Figure 3, were used to evaluate the raw data to determine if potential outliers exist. The first plot evaluates if any outliers exist in the data with respect to the respondents, while the second

plot evaluates the existence of outliers with respect to the evaluation survey questions.

Respondent Box and Whisker Plot

```
        -----------------
---(---[  +      )      ]-------------------        *      *
        -----------------
+---------+---------+---------+---------+---------+-------
1.5       1.8       2.1       2.4       2.7       3.0
```

Question Box and Whisker Plot

```
               ----------
    -----------[(   +   ])                 *        *
               ----------
+---------+---------+---------+---------+---------+-------
-1.0      1.5       2.0       2.5       3.0       3.5
```

\+ The middle (MEDIAN) for the data set.

[] Encloses the middle half of the data.

() Represent approximately 95% confidence intervals about the medians.

-- "Whiskers" that indicate typical data values.

* Indicates POSSIBLE outliers.

Figure 3. Box and Whisker Plot
Evaluation Survey 1 Data

As can be seen from Figure 3, two possible outliers exist within the data set for both the respondents and the

questions. It is important to determine, statistically, if outliers do in fact exist in the data set so appropriate measures can be taken to eliminate their influence. A Friedman non-parametric 2-way ANOVA test was used to test the null hypothesis that no difference exists in the probability distribution for each of the respondents, and that no difference exists in the probability distribution for each of the survey questions. The results can be seen in Table 5.

TABLE 5

FRIEDMAN TEST

DETERMINATION OF OUTLIERS

	Test Statistic	P-Value
Respondents	37.26	.0002
Questions	44.43	.0000

At the .05 level of significance, the null hypothesis can be rejected based on the P-Value for the two tests. The conclusion that can be drawn from these tests are that differences do exist in the probability distributions for both the respondents and for the questions.

The next questions to answer, then, are which distributions are different, and, does a pattern exist that supports the results of the Box and Whisker plot that outliers exist in the data for both the respondents and the questions?

To answer these questions, a Wilcoxon Signed Ranked test was first performed for each possible pair of questions. The researcher felt it important to identify any possible outliers with the questions first so corrective actions can be taken prior to performing the Wilcoxon Signed Ranked test on the respondents. That is, by first eliminating confounds inherent with the questions, the confounds inherent with respect to respondents are clearer to recognize. Table 6 will show the results of the test for each pair of questions. The test null hypothesis used during each of the tests is that both probability distributions are identical. The test was conducted at the .05 level of significance. A matrix is used to show the relationships between the pairs of questions being tested. A series of asterisks (*) and Xs will be used to represent the results of the test. An asterisk indicates a P-Value greater than the .05 level of significance, along with a conclusion that both probability distributions are identical. An X indicates a P-Value less than the .05 level of significance and follows with a conclusion that the null hypothesis can

be rejected. With an X result, the resulting conclusion is that the two probability distributions are different. To provide proof that outliers do exist with respect to the questions, the Xs are expected to be concentrated among the possible outlier(s). If no outliers exist, the Xs should be mixed uniformly throughout the matrix.

The results of the Wilcoxon Signed Rank test show questions 4 and 6 have an abnormally large number of differences in their probability distributions as compared to the others. Question 4 can be explained because 12 of the 13 volunteers marked the same response to the question (See Question 4, Survey 1, This Chapter). No confounds were identified to justify removal of this question from the data set. Question 6 is singled out because its probability distribution is also significantly different than those of the other questions. Six of the 13 respondents responded with a "strongly disagree" to the question. As noted in the non-statistical analysis section of this chapter, seven of the 13 respondents provided comments reflecting dissatisfaction with the format of the WRSK listing. <u>The results of the Wilcoxon Signed Rank test, coupled with the comments made by the respondents provide enough evidence to conclude a confound exists that is effecting the results of the data set</u>. That is, the unsatisfactory format of the WRSK listing is reflected in the responses made by the respondents.

TABLE 6

WILCOXON SIGNED RANK TEST

QUESTIONS

Evaluation Survey Questions

1	2	3	4	5	6	7	8	9	10	
	*	*	X	*	X	*	*	*	*	1
		*	*	*	X	X	*	*	*	2
			X	*	X	*	*	*	*	3
				X	X	X	X	X	X	4
					X	X	*	*	*	5
						*	X	X	X	6
							X	X	*	7
								*	*	8
									*	9
										10

Total * = 26

Total X = 19

45

Frequency distribution of X
for each Question

	1	2	3	4	5	6	7	8	9	10
Total Xs per Quest.	2	2	2	8	3	8	5	3	3	2

Consequently, an analysis of the data to determine the usefulness of the database model is seriously tainted by the

responses made for question 6. Therefore, responses to question 6 will be removed from the data set.

With question 6 removed from the data set, a second Box and Whiskers plot was performed on the data. Figure 4 shows that two possible and one probable outlier exists with respect to the probability distributions of the respondents.

```
      -------------
      [ (    +    ] )                    *           *      O
      -------------
 +---------+---------+---------+---------+---------+-------
 1.5       1.8       2.1       2.4       2.7       3.0
```

+ The middle (MEDIAN) for the data set.

[] Encloses the middle half of the data.

() Represent approximately 95% confidence intervals about the medians.

-- "Whiskers" that indicate typical data values.

* Indicates POSSIBLE outliers.

O PROBABLE outlier.

Figure 4. Box and Whisker Plot of Data Set With Question Six Removed

Analysis should be performed on any outliers that lie beyond the fences to determine if they belong to a different population as compared with the sample which was drawn.

A Wilcoxon Signed Rank test can now be performed on the data to determine if the possible outliers identified can be isolated.

Table 7 shows the results of the test for each pair of respondents. The same test hypothesis used during the previous Wilcoxon Signed Rank test will be used here as well. To restate again, the test null hypothesis for each pair of respondents is that both probability distributions are identical. The test was conducted at the .05 level of significance. Again, a matrix is used to show the relationships between the pairs of questions being tested. A series of asterisks (*) and Xs will also be used to represent the results of the test. An asterisk and X have the same meaning as described earlier in this section. To provide proof that outliers do exist with respect to the respondents, the Xs should be concentrated among the possible outlier(s). If no outliers exist, the Xs should be mixed uniformly throughout the matrix.

As can be seen from the frequency distribution in Table 7, respondents C and M have the largest concentration of non-identical probability distributions. Though a third outlier was identified with the Box and Whisker plot, the results of the Wilcoxon Signed Rank test failed to support that a third outlier exists. <u>The results of the Wilcoxon</u>

TABLE 7

WILCOXON SIGNED RANK TEST

RESPONDENTS

A	B	C	D	E	F	G	H	I	J	K	L	M	
	*	*	*	*	*	*	*	*	*	*	*	*	A
		X	*	*	*	*	*	*	*	*	*	*	B
			*	*	X	X	X	X	X	X	X	*	C
				*	*	*	*	*	*	*	*	*	D
					*	*	*	*	*	*	*	*	E
						*	*	*	*	*	*	*	F
							*	*	*	*	*	X	G
								*	*	*	*	X	H
									*	*	*	X	I
										*	*	X	J
											*	X	K
												*	L
													M

Total * = 65

Total X = 13

78

Frequency distribution of X
for Respondents

	A	B	C	D	E	F	G	H	I	J	K	L	M
Total Xs per Resp.	0	1	8	0	0	1	2	2	2	2	2	1	5

Signed Rank test, however, provides enough evidence to categorize respondents C and M as outliers to the data set. Consequently, the responses from respondent C and respondent M will be removed from the data set.

It must be noted at this point that a double edge sword exists with the collected data. On the one hand, a reduction in number of respondents, from an already small sample size, weakens the strength of the statistical results. On the other hand, allowing confounds to exist in the data set prevents a clear understanding of the data. Confounds cloud the water, so to speak, preventing the observance of true cause and effect relationships. This researcher believes it more important to have a small amount of data, clear of confounding effects, than to have a larger amount of data with confounds that adversely influence the relationships of the independent and dependent variable being tested.

Analyzing Modified Data.

With suspected confounds removed from the data set, evaluation of the modified data set can now be accomplished. As stated in the Evaluation Survey Development section of this chapter, the intent is to determine whether, in the opinion of the volunteers, the database model is a useful tool in providing realistic logistical information to response cell members.

Descriptive statistics and the Friedman non-parametric two-way ANOVA procedure were used on the data set to evaluate the opinion of the volunteers. Descriptive statistics for the data set are shown in Table 8.

TABLE 8

DESCRIPTIVE STATISTICS

MODIFIED EVALUATION SURVEY 1 DATA

Respondents	Sample Size	Mean	Standard Deviation
A	9	1.89	0.782
B	9	1.67	0.707
D	9	1.89	0.601
E	9	2.78	1.302
F	9	1.78	0.667
G	9	1.56	0.527
H	9	1.67	0.500
I	9	1.56	1.014
J	9	1.56	1.014
K	9	1.56	1.014
L	9	1.89	1.054
	Average Mean =	1.80	

As Table 8 shows, the average mean for all respondents is 1.80. The question that must now be answered is whether 1.80 is representative for all respondents.

An analysis of variance (ANOVA) procedure can be used to determine if the average mean is representative for all respondents. Many ANOVA procedures exist. In choosing which procedure to use, i.e. parametric, non-parametric, one-way or two-way, assumptions for each procedure had to be analyzed against the data. Parametric ANOVA procedures have restrictive data assumptions that, in this case, were not met. Parametric ANOVA procedures require the response variance be statistically equal. The standard deviations for each of the respondents are not statistically equal and thereby prevent the use of parametric ANOVA procedures. On the other hand, non-parametric procedures are far less restrictive on required data assumptions. Furthermore, their strength lies in their general applicability (McClave and Benson 1988:991). The two non-parametric procedures considered for use were the Kruskal-Wallis one-way ANOVA and the Friedman two-way ANOVA. The Friedman two-way ANOVA was chosen over the one-way ANOVA procedure because it allows the blocking of variables. The advantage here is that the blocking of variables reduces the "Within" variability for the denominator in the F statistic calculation. Consequently, a larger F statistic results which amplifies the differences in the probability distributions during the test. The results of the Friedman test are shown in Table 9. The procedure tests the null hypothesis that no difference

exists in the probability distribution for each of the respondents at the .05 level of significance.

TABLE 9

ANALYSIS OF MODIFIED DATA USING FRIEDMAN'S TEST

	Test Statistic	P-Value
Respondents	12.76	.2372

The results of the test show that the null hypothesis cannot be rejected at the .05 level of significance. Meaning, enough statistical evidence does not exist to dispute the hypothesis that the probability distributions for each respondent are identical.

Evaluation Survey 2 Data Analysis.

The second evaluation survey was given to personnel who have had previous CPX experience as a response cell member. The purpose of this survey was to provide a means of measuring the degree of logistic realism provided by the database model over other methods in use today. To provide meaningful statistical comparisons, participants must satisfy two conditions. First, they must have had previous experience as a response cell member during a CPX at some time in their

career. Second, they should be somewhat familiar with the KC-135 aircraft to include its capabilities and its logistical support requirements. Of the thirteen participants, only two individuals have had previous CPX experience, and neither of them had any experience with the KC-135 aircraft. Even though the two individuals completed Evaluation Survey 2, their responses provided no information that could be useful for meaningful statistical analysis and was therefore not used.

Summary

Chapter IV provided a detailed discussion of the analysis, findings, and results of this thesis effort. The Chapter focused on procedures used to collect source data for the database model, procedures for development of the database model, procedures for the testing of the database model, and procedures used to analyze the results. Chapter V will now focus on conclusions that can be drawn from this thesis effort, along with recommendations to further the advancement of this effort.

V. Conclusions and Recommendations

Overview

The intention of this thesis effort is to provide an alternative method for determining and evaluating critical logistical requirements to support mission taskings during Command Post Exercises (CPXs). Furthermore, it is intended to make exercise play at the response cell level more realistic so that the environment of war in CPXs is more closely replicated and our forces and command authorities are better prepared to carry out their duties more effectively.

Through this research, a historical aircraft maintenance database model has been used to improve exercise realism. Historical database models are based on the premise that realistic data collected from actual war-like missions can be placed in a database for use by response cell members to provide simulated, yet realistic, logistical requirements during Command Post Exercises. Historical database models realistically task logistic needs against operational requirements to meet mission taskings. Consequently, meaningful constraints are imposed that force exercise players to think through problems that would more realistically exist under war-like conditions.

Sound strategic and tactical decisions cannot be made without realistic input on logistical support capabilities. The database model takes a significant step toward providing

decision makers a clearer picture of logistical capabilities by incorporating war-like logistical data into exercise play at the response cell level.

This chapter contains the concluding remarks and recommendations from the foregoing presentation. A discussion on meeting the research objectives, to include conclusions, will be presented first, followed by recommendations for handling the research documents and recommendations for further research efforts. The chapter will close with summary remarks.

Primary Findings

The primary purpose of this thesis effort was to provide HQ SAC/LGL a historical database model that would improve realism in CPXs for use with the KC-135A/E/R aircraft. To accomplish this objective, several investigative questions were used to guide the research effort (See Ch 1, Pg 5-6).

The first research question examines the issue of war-like exercise or deployment data versus routine peacetime training data. Of critical importance to the historical database model is the use of war-like data in the database development. Considerable research was conducted through literature searches and informal telephone interviews to determine if ETTF missions accurately depicted aircraft logistics requirements during war. Though no hard and

conclusive research evidence was found to support the premise that ETTF data depicts aircraft logistics requirements more realistically than does other routine peacetime flying data, it is reasonable to expect that the training missions flown during ETTF deployments realistically replicate expected wartime mission taskings. With this supposition, it would logically follow that aircraft logistics requirements from ETTF missions would provide more realism than would routine peacetime flying data.

The next four investigative questions were examined during a mock exercise that was designed to test the database model. Constructs employed in Evaluation Survey 1 (See Appendix E) were designed to answer the investigative questions concerning whether the database model was realistic, whether the database model was easy to use, and whether the database model provided the needed information necessary for response cell members to carry out their duties effectively. The mock exercise also demonstrated the capability of the database model to be used in compressed exercise schedules. The database model's capability, to be used during compressed exercise schedules, offer a high degree of flexibility where time considerations become a constraint to the exercise.

Conclusions

Due to the limitations imposed by the mock exercise testing procedure, only superficial conclusions can be made concerning the data collected from Evaluation Survey 1.

The degree of confidence in the conclusions are partially based on the degree to which confounds effecting the data are minimized. The degree to which confounds exist in an experiment has an inverse effect on the degree of confidence placed on the test results. A higher degree of confidence is accepted as the effects of confounds on the experiment are recognized and reduced. The limitations of conducting a mock exercise to test the database model rather than using a CPX (the preferred method) are realized by an increased effect of confounds on the experiment results. Consequently, less confidence is placed on the final analysis of the data. Therefore, only limited generalized conclusions can be made about the database model.

Final analysis of the data show that the probability distributions for each respondent are statistically identical with an average mean of 1.80 (See Ch 4, Table 8). Based on the Likert scale, as used in Evaluation Survey 1, the average mean score suggests the respondents "Tend To Agree" the database model was useful toward providing realistic logistical information to response cell members. Therefore, the researcher concludes that the database model

provides response cell members with a useful tool to obtain realistic logistical information they would need to carry out their duties effectively.

A conclusion cannot be made, however, regarding whether the database model improves logistical realism over existing mathematical models currently in use. To make such a conclusion would require a comparative analysis of personnel with prior experience using both mathematical models and historical database models. Unfortunately, personnel were not available during the mock exercise that possessed the necessary CPX experience and aircraft experience to perform any meaningful statistical analysis.

Recommendations

Handling Research Documents.

It is recommended that SAC/LGL maintain and reproduce as necessary the KC-135A/E/R Aircraft Maintenance Logistics Database, Information Guide, Practice Database, and Training Slides.

Future Research.

Both with the B-52G database model and with this database model, statistical evidence has not been gathered in sufficient quantity to prove or disprove the hypothesis that historical databasing improves realism in CPXs over other existing methods. A next step in the research is to test

these models extensively at the CPX level. Information gathered through this research effort and previous research by Capt Hall (See Hall, 1989) provide a foundation of solid pre-test data. Testing the models using a Pre-test/Post-test experimental design would provide useful statistical information to determine if the models support the hypothesis of improved logistics realism during CPXs. Therefore, it is recommended that SAC/LGL solicit further research to validate the hypothesis that historical databasing (to include both the B-52G and the KC-135A/E/R database models) improves realism over mathematical models currently in use today. This type of research could be accomplished either through the Air Force Institute of Technology's School of Systems and Logistics Graduate Program, or through the Air Force Logistics Management Center (AFLMC) at Gunter AFB, Alabama.

It is also recommended that the Historical Database Model be expanded to include other aircraft in the Air Force inventory. Tactical aircraft, to include the F-15 and F-16, would be ideal candidates for such a database model. Tactical aircraft should have readily available source data to develop the database model. Military Exercises such as Red Flag, Coronet Warrior, or even routine deployments can provide the logistical data necessary to develop the historical database model.

Summary

The defense forces of this nation operate in an ever changing and dynamic environment. The dramatic changes in world events since 1989 have caused considerable debate over the needed strength of our nation's defense forces. A perceived decreasing threat from WARSAW Pact countries have caused this nation to reconsider its threats and to adjust its military strength accordingly. Furthermore, the Bush Administration and the American public expect the Defense Department to work more effectively with their limited resources. The defense forces of this nation should work smarter toward maximizing military effectiveness with the resources they are provided.

Budget reductions resulting from this changing environment will surely lead to reductions in our force capabilities. Among others, a most notable reduced force capability will result from a reduction in manpower authorizations. As our manning authorizations are reduced, the most experienced and educated of our forces leave the military via early retirement opportunities or through "Early Out" programs. Voids left by these departures are generally filled with inexperienced and unseasoned personnel.

The challenge to all Air Force leaders is to minimize the effects of force reductions on military readiness

through proactive employment of tools such as the Historical Database Model concept. The use of Historical Databasing during Command Post Exercises provide the needed, improved, and realistic training for military leaders that allow force readiness to be maintained effectively. Furthermore, an added benefit of the Historical Database Modeling concept is that it is relatively inexpensive to develop. As evidenced by both this thesis effort and the B-52G thesis effort, only one person, through the sponsorship of SAC/LGL, was needed to develop the historical database model and its associated documentation. The actual time needed to develop such a model can be dramatically reduced over the year used to develop this thesis effort. This could be accomplished by employing a person full time and using a methodology similar to the one employed by this researcher or by the methodology used by Capt Hall during his research effort (See Hall, 1989:Ch 3, 1).

Another benefit of historical databasing is its simplicity. The model is relatively easy to build if available data exists. Source data needed for this type of model can be gathered through Flag Exercises or aircraft deployments so long as the flying missions closely replicate expected wartime taskings. Because war-like data is readily available for many aircraft types, the model has broad application over a wide variety of CPX scenarios. The model

can be applied to CPXs of varying types and degrees and does not require any specialized training or equipment beyond minimal familiarization training. Additionally, the model is based on accepted maintenance practices used in one form or another by most major commands throughout the Air Force.

Another important benefit of the model is that it is used at the lowest level of a CPX. At the response cell level, both logistic requirements and operational needs must merge to effectively accomplish mission taskings. Consequently, by use of the model, a clearer picture of a units capabilities, limitations, weaknesses, and strengths emerge and ripple through the exercise command and support infrastructures. The resulting benefit is improved realism at all levels. Logisticians and operators work jointly to solve constraining problems while decision makers at all levels are provided alternatives based on a more realistic foundation of logistical support. Recommendations and decisions can now be based on realistic input rather than generated and often inaccurate data.

Improved realism in CPXs does not have to be a result of sophisticated and complex systems. Simplistic, yet effective tools are available. The historical database modeling concept is one such tool whose time has come.

Appendix A: KC-135A/E/R Aircraft Maintenance Logistics Database

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0

Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	HUC	Qty	In HRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER: 1 (KC-135A/E/R)							
	2	0.5	6620006212902	TOTALIZER GAUGE	51911	1				T/O+1:0 OFFLOAD TOTALIZER INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER: 2 (KC-135A/E/R)							
	2	3.0	5821001387991	#2 RCVR XMTR	63SA0	1				T/O+0:30 #2 COMM RADIO W/N ACCEPT PRE
	2	1.5	5930010853351	PRESSURE SWITCH	72YK0	1				T/O+0:45 DNS LOW AIR LIGHT ILLUMINATE
	2	3.0	59990[illegible]	RDR ANTENNA	722A0	1				T/O+0:30 RADAR STAB UNRELIABLE, DUMPS
SS			MAINTENANCE EVENT CONTROL NUMBER: 3 (KC-135A/E/R)							
	2	7.0	5841008454243	STAB DATA GEN	722H0	1				T/O+0:10 APN 59 RADAR PRESENTATION UN
SS			MAINTENANCE EVENT CONTROL NUMBER: 4 (KC-135A/E/R)							
	2	2.0	1680006566170FL	BOOM NOZZLE	46771	1				P/F BOOM SIGNAL COIL CHECKS OPEN
	2	4.5	2915002965828	F/L CNTRL VLV	46461	1				T/O+1:15 4000 LBS FUEL XFERRED FROM F
SS			MAINTENANCE EVENT CONTROL NUMBER: 5 (KC-135A/E/R)							
	2	4.0	1680006566170FL	BOOM NOZZLE	46771	1				P/F BOOM SIGNAL COIL CHECKS OPEN
	2	12.0	6610001553519	PITOT TUBE	51156	1				T/O+4:00 PILOT'S AIRSPEED INDICATOR U
SS			MAINTENANCE EVENT CONTROL NUMBER: 6 (KC-135A/E/R)							
	3	12.0	1650009209725	FWD A/R PUMP LN	45139	1				P/F HYD FLUID FOUND IN FORWARD BODY F
SS			MAINTENANCE EVENT CONTROL NUMBER: 7 (KC-135A/E/R)							
	[illegible]	6.5	6610004631865	ALTIMETER	51132	1				T/O+1:00 PILOT'S ALTIMETER W/N RESET
SS			MAINTENANCE EVENT CONTROL NUMBER: 8 (KC-135A/E/R)							
	2	4.0	5820011380486	RCVR XMITTER	722X0	1				T/O+0:40 RADAR HAS EXCESSIVE GROUND R

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0

Actt T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		9 (KC-135A/E/R)					
	2	5.5	5939008571413	RDR ANTENNA	722A0	1				T/0+1:00 NAV'S APN-59 RADAR PICTURE H
SS			MAINTENANCE EVENT CONTROL NUMBER:		10 (KC-135A/E/R)					
	2	2.5	5826011244793	RCVR XMITTER	72VA0	1				T/0+0:05 PILOT'S RADIO ALTIMETER FLAG
SS			MAINTENANCE EVENT CONTROL NUMBER:		11 (KC-135A/E/R)					
	2	9.0	6610011464953	FSAS COMPUTER	51EA0	1				T/0+0:30 FCAS FLAP INPUT INTERMITTENT
			1560000987239FL	FLAP XMITTER	51424	1				
SS			MAINTENANCE EVENT CONTROL NUMBER:		12 (KC-135A/E/R)					
	2	7.0	5320002804465	RCVR XMITTER	72CBA	1				T/0+0:45 NAV'S APN-69 RADAR INOPERATI
	2	2.5	6615005892592	MC-1 AMPLIFIER	52111	1				T/0+0:30 ELEVATOR AXIS DOESN'T RESPON
SS			MAINTENANCE EVENT CONTROL NUMBER:		13 (KC-135A/E/R)					
	2	3.0			6411S	0				P/F PILOT'S INTERPHONE YOKE AND NOSEW
	2	2.0			46850	0				T/0+0:10 SIGNAL COIL TEST METER INOPE
	2	5.4			5241F	0				T/0+1:00 N1 COMPASS 3 DEGREES IN ERRO
	2	1.2			23HAK	0				T/0+4:55 #3 ENG RPM BELOW IDLE WITH T
					51310	0				
SS			MAINTENANCE EVENT CONTROL NUMBER:		14 (KC-135A/E/R)					
	2	4.5	5831005384250	CONTROL BOX	64110	1				T/0+0:15 PILOT'S INTERPHONE CUTS OUT
	2	4.0	6240002839598	LIGHT	44266	1				T/0+4:00 RIGHT MAIN LANDING GEAR LIGH
	2	2.0	6240002287130	LIGHT	44225	1				T/0+2:00 PDI CENTER HOLD LIGHT OUT ON

KC-135 H/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0

Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
$$			MAINTENANCE EVENT CONTROL NUMBER:		15	(KC-135A/E/R)				
	2	2.5	6610012270781	FUEL MGMT CMPTR	51EC0	1				T/O+0:30 FSR DISPLAYED FUEL MGMT SYST
			6610011464953	FSAS CMPTR	51EA0	1				
	2	2.0	5826001345974	SLEW COUPLER	51AJ0	1				T/O+2:30 BOTH HSI HEADING SET MARKERS
$$			MAINTENANCE EVENT CONTROL NUMBER:		16	(KC-135A/E/R)				
	2	0.1	6610012277222	FUEL MGMT CMPTR	51EB0	1				FUEL INDICATION FOR #1 RESERVE FLUCTU
$$			MAINTENANCE EVENT CONTROL NUMBER:		17	(KC-135A/E/R)				
	2	2.5	5985010537676CH	RDR ANTENNA	722H0	1				T/O+1:00 PILOT AND NAV'S RDR SHOWS AD
$$			MAINTENANCE EVENT CONTROL NUMBER:		18	(KC-135A/E/R)				
	2	4.0			42000	0				T/O+1:50 ELECTRICAL GENERATORS SWAPPI
$$			MAINTENANCE EVENT CONTROL NUMBER:		19	(KC-135A/E/R)				
	2	7.3			23MAC	0				T/O+0:05 ON T/O, #3 ENG EGT FLUCTUATE
$$			MAINTENANCE EVENT CONTROL NUMBER:		20	(KC-135A/E/R)				
	2	1.0			46750	0				T/O+0:20 BOOM LATCH LEVER DOESN'T DIS
	2	1.0			46850	0				T/O+0:20 SIGNAL COIL TEST WILL NOT RU
	2	10.5	5826001345981	HSI	51AA0	1				T/O+0:01 PILOT'S COURSE KNOB ON HSI I
	2	7.0			51EA0	0				T/O+3:00 FSA/CAS DUMPED ALL INS AND D
$$			MAINTENANCE EVENT CONTROL NUMBER:		21	(KC-135A/E/R)				
	2	3.0	5821011050155	CONTROL BOX	61AC0	1				T/O+1:00 HF RADIO TRANSMIT AND RECEIV
$$			MAINTENANCE EVENT CONTROL NUMBER:		22	(KC-135A/E/R)				

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0

Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	1.0			63XA0	0				T/O+0:30 #1 UHF RADIO WEAK BUT READAB
	2	8.6	6610052277222	IFMP	51EB0	1				T/O+2:30 #2 MAIN FUEL TANK AFT BOOST
SS			MAINTENANCE EVENT CONTROL NUMBER:		23	(KC-135A/E/R)				
	2	4.0			722N0	0				T/O+0:30 APN-59 INOPERATIVE IN SEARCH
	2	3.5	5920002804465	RCVR XMITTER	72CBA	1				T/O+0:30 COULD NOT PAINT APN-69 BEACO
SS			MAINTENANCE EVENT CONTROL NUMBER:		24	(KC-135A/E/R)				
	2	7.5	1660005889200	AUTO PRES CNTRL	41216	1				T/O+1:00 AT 14,000 FT. CABI .SSURE
SS			MAINTENANCE EVENT CONTROL NUMBER:		25	(KC-135A/E/R)				
	2	1.0			23HAK	0				T/O+4:05 #2 ENG OIL PRESS AND RPM DRO
SS			MAINTENANCE EVENT CONTROL NUMBER:		26	(KC-135A/E/R)				
	2	7.2			52110	0				T/O+4:00 AUTOPILOT AILERON AXIS CAUSE
	2	4.0			51100	0				T/O+1:00 AIRSPEED INDICATOR 5 KNTS OF
SS			MAINTENANCE EVENT CONTROL NUMBER:		27	(KC-135A/E/R)				
	2	2.5	5841008047159	RDR CNTRL BX	722L0	1				T/O+0:05 APN-59 PICTURE ONLY IN 30NM
SS			MAINTENANCE EVENT CONTROL NUMBER:		28	(KC-135A/E/R)				
	2	2.0			46330	0				T/O+2:00 BOOM NOZZLE W/N REMAIN SEATE
	2	23.0	6610001901414	TAS INDICATOR	51131	1				T/O+0:10 NAV'S TAS INDICATOR READS 50
			6610005300028	PILOT VVI	51116	1				
SS			MAINTENANCE EVENT CONTROL NUMBER:		29	(KC-135A/E/R)				
	2	2.3	1650006336249	ACCUMULATOR	45161	1				T/O+0:10 LEFT HYD SYSTEM READS LOW

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0

Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		30	(KC-135A/E/R)				
	2	1.5			63XA0	0				P/F #1 COMM RADIO INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER:		31	(KC-135A/E/R)				
	2	2.5	6130007728567NT	PWR SUPPLY	5131C	1				T/O+1:00 OFFLOAD TOTALIZER AND TRANSF
	2	6.5			51111	0				T/O+0:22 PILOT'S AIRSPEED INDICATOR R
SS			MAINTENANCE EVENT CONTROL NUMBER:		32	(KC-135A/E/R)				
	2	2.0			41116	0				T/O+1:00 NO INCREASE IN #2 EPR WHEN #
	2	0.5	6240002287130	LIGHT	44225	3				T/O+2:00 CENTER FWD AND AFT PILOT DIR
SS			MAINTENANCE EVENT CONTROL NUMBER:		33	(KC-135A/E/R)				
	2	7.0			63V00	0				T/O+0:30 COMM #2 RADIO UNABLE TO TRAN
	2	8.5	6605010352003	CDU	72YC0	1				T/O+3:00 NAV'S CDU W/N TAKE WAYPOINT
SS			MAINTENANCE EVENT CONTROL NUMBER:		34	(KC-135A/E/R)				
	2	1.0			12AA0	0				T/O+0:30 PILOT'S SEAT PERIODICALLY UN
SS			MAINTENANCE EVENT CONTROL NUMBER:		35	(KC-135A/E/R)				
	2	8.2	6130007728567NT	PWR SUPPLY	5131C	1				T/O+0:10 ALL FUEL FLOW GAUGES READ LO
	2	6.0	6605005578206	N1 AMPLIFIER	5241F	1				T/O+0:30 AUTOPILOT W/N HOLD HEADING,
SS			MAINTENANCE EVENT CONTROL NUMBER:		36	(KC-135A/E/R)				
	2	1.0	5831005384250	INPH CONT BX	64110	1				T/O+0:30 INSTRUCTOR'S INTERPHONE PANE
	2	1.5	6615011564148	J4 GYRO	5242B	1				T/O+0:45 J4 COMPASS BEGAN DRIFTING OF

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0

Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		37	(KC-135A/E/R)				
	2	1.0			61DD0	0				T/O:0.30 HF RADIO WEAK, FAULT LIGHT I
	2	1.5	6615005704966	N1 SLAVE CONTL	5241E	1				T/O:1:00 N1 COMPASS DISPLAYS WRONG HE
SS			MAINTENANCE EVENT CONTROL NUMBER:		38	(KC-135A/E/R)				
	2	8.0	6'20000784470	EPR XDUCER	23NUD	1				#2 EPR INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER:		39	(KC-135A/E/R)				
	2	1.0	5841010537874	SCOPE	722E0	1				T/O:0:05 NAV'S RADAR SCOPE SPIKES ABO
	2	3.0	6615005506628	GYRO	51142	1				T/O:0:30 PILOT'S ADI SHOWS CONSTANT 5
SS			MAINTENANCE EVENT CONTROL NUMBER:		40	(KC-135A/E/R)				
	2	2.7			51910	0				T/O:1:00 OFFLOAD TOTALIZER READS 15.4
					46850	0				
SS			MAINTENANCE EVENT CONTROL NUMBER:		41	(KC-135A/E/R)				
	2	3.2			52126	0				T/O:1:00 AUTOPILOT TURN KNOB W/N TURN
	2	1.5	5826001345977	ADI	51AAB	1				T/O:2:00 PILOT'S ADI SHOWS 5 DEGREES
SS			MAINTENANCE EVENT CONTROL NUMBER:		42	(KC-135A/E/R)				
	2	2.0	6615005350179	COUPLER	52113	1				T/O:0:45 AILERON AXIS OF AUTOPILOT W/
SS			MAINTENANCE EVENT CONTROL NUMBER:		43	(KC-135A/E/R)				
	2	2.0			46750	0				T/O:1:00 WHEN BOOM WAS IN TRAIL BOOM
SS			MAINTENANCE EVENT CONTROL NUMBER:		44	(KC-135A/E/R)				

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0

Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
*	3	3.0	3010007395580HS	FLEX SHAFT	42196	1				#3 ENG CSD SHAFT SHEARED
	2	1.0	3010007395580HS	FLEX SHAFT	42196	1				T/O+4:30 #3 GENERATOR QUIT
SS			MAINTENANCE EVENT CONTROL NUMBER:		45	(KC-135A/E/R)				
	2	2.0			46822	0				P/F BOOM SIGHTING DOOR HOSE FITTING L
	2	2.0			5241F	0				P/F N1 COMPASS DIRECTIONAL GYRO HEADI
SS			MAINTENANCE EVENT CONTROL NUMBER:		46	(KC-135A/E/R)				
	2	6.0			52135	0				T/O+1:00 AUTOPILOT W/N HOLD WINGS LEV
SS			MAINTENANCE EVENT CONTROL NUMBER:		47	(KC-135A/E/R)				
	2	1.0	5826011244793	RCVR/XMITTER	72VH0	1				T/O+0:05 PILOT'S RADIO ALT FLAG IN VI
	2	1.7	5826001345974	GYRO	51AAE	1				T/O+0:10 PILOT'S RATE OF TURN FLAG RE
	2	0.5			12AAH	0				P/F COPILOT'S INERTIAL REEL W/N LATCH
SS			MAINTENANCE EVENT CONTROL NUMBER:		48	(KC-135A/E/R)				
	2	0.1			51AAD	0				P/F COPILOT'S HSI HEADING FLAG IN VIE
SS			MAINTENANCE EVENT CONTROL NUMBER:		49	(KC-135A/E/R)				
	2	1.0			72V00	0				T/O+1:00 PILOT'S RADIO ALTIMETER FLAG
	2	21.0	5826001345981	HSI	51AAD	1				T/O+3:00 COPILOT'S HSI HEADING FLAG C
SS			MAINTENANCE EVENT CONTROL NUMBER:		50	(KC-135A/E/R)				
*	3	0.5			4215M	0				#1 GENERATOR HAS NO LOAD
	2	3.5	6615005092592	AMPLIFIER	52111	1				P/F AUTOPILOT AILERON AXIS ENGAGES BU
	2	2.5	6615005561979	CONTROLLER	52134	1				T/O+0:30 ALTITUDE HOLD DOES NOT MAINT
	2	2.3	5999008671413	RCVR/XMITTER	712A0	1				T/O+1:30 TACAN INOPERATIVE

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0

Acft I.N.	Lndg Code	Fix time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		51	(KC-135A/E/R)				
	2	3.0			46856	0				T/O+2:00 WHEN BOOMER TRIGGERED DISCON TO DISCONNECT THEN TO READY
SS			MAINTENANCE EVENT CONTROL NUMBER:		52	(KC-135A/E/R)				
	3	46.0			49421	0				T/O+0:40 #2 ENG FIRELIGHT ILLUMINATED
	2	3.7	5826001345977	ADI	51AAB	1				T/O+0:10 PILOT'S RGA GAVE EXCESSIVE C
SS			MAINTENANCE EVENT CONTROL NUMBER:		53	(KC-135A/E/R)				
	3	75.5	6615005506628	MD1 GYRO	51142	1				MD1 GYRO CANNIBALIZED FOR OTHER AIRCR
SS			MAINTENANCE EVENT CONTROL NUMBER:		54	(KC-135A/E/R)				
	2	5.0			46856	0				T/O+1:00 BOOMER'S SIGNAL COIL SENDS D
SS			MAINTENANCE EVENT CONTROL NUMBER:		55	(KC-135A/E/R)				
	3	1.0			46771	0				BOOMER'S SIGNAL COIL PRESS TO TEST DI
SS			MAINTENANCE EVENT CONTROL NUMBER:		56	(KC-135A/E/R)				
	2	1.0			46850	0				T/O+0:30 BOOM SYSTEM ADVANCED TO CONT
	2	2.0			23000	0				T/O+2:30 #1 ENG W/N RESPOND TO ENG TH
SS			MAINTENANCE EVENT CONTROL NUMBER:		57	(KC-135A/E/R)				
	2	2.5	5826001345968	RGA INTRFC UNIT	51BB0	1				T/O+0:01 COPILOT'S ADI COMMAND BARS W
	2	2.5	5826001345976	COMPUTER	51AC0	1				T/O+4:00 PILOT'S ADI COMMAND BARS DIR
SS			MAINTENANCE EVENT CONTROL NUMBER:		58	(KC-135A/E/R)				

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	11.0	6680005506462	PROBE	51555	1				T/O+1:00 #4 MAIN FUEL TANK GAUGE READ
	2	2.0			51E00	0				T/O+1:30 FSAS DID NOT LOAD ALL WAYPOI
	2	1.0	5826001345982	FLT DIR CONTL	51AAA	1				T/O+0:30 COPILOT'S ALTIMETER DOES NOT
SS			MAINTENANCE EVENT CONTROL NUMBER:		59	(KC-135A/E/R)				
	2	4.0			51100	0				T/O+0:20 COPILOT'S AIRSPEED INDICATOR
	2	1.0			23LBA	0				T/O+4:00 #3 ENG ANTI-ICE VALVE CIRCUT
SS			MAINTENANCE EVENT CONTROL NUMBER:		60	(KC-135A/E/R)				
	2	0.5			23LB0	0				#3 ENG DUE ANTI-ICE ELECTRIC CHECKOUT
SS			MAINTENANCE EVENT CONTROL NUMBER:		61	(KC-135A/E/R)				
	2	2.5	5826001345974	GYRO	51AAE	1				T/O+1:30 PILOT'S ADI TILTS RIGHT APPX
SS			MAINTENANCE EVENT CONTROL NUMBER:		62	(KC-135A/E/R)				
	2	2.0	5826001345973	AMPLIFIER	51AB0	1				T/O+0:30 PILOT'S ADI GYRO FLAG IN VIE
SS			MAINTENANCE EVENT CONTROL NUMBER:		63	(KC-135A/E/R)				
	2	0.7			6419C	0				T/O+4:45 IP SEAT RADIO SELECTOR SWITC
SS			MAINTENANCE EVENT CONTROL NUMBER:		64	(KC-135A/E/R)				
	2	2.0	1680006566170FL	TERMINAL	46771	2				T/O+3:00 SIGNAL COIL STAYS IN OPEN PO
SS			MAINTENANCE EVENT CONTROL NUMBER:		65	(KC-135A/E/R)				
	2	0.7			4685A	0				T/O+2:15 BOOM AZIMUTH GAUGE DOESN'T A
	2	4.0			51E00	0				T/O+3:00 CENTER WING TANK FUEL GAUGE

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		66	(KC-135A/E/R)				
	2	2.0			46755	0				T/O+0:15 BOOM SLUGGISH AND W/N ATTAIN
SS			MAINTENANCE EVENT CONTROL NUMBER:		67	(KC-135A/E/R)				
	2	3.0			46755	0				T/O+0:20 BOOM W/N REACH 45 DEGREES LO
SS			MAINTENANCE EVENT CONTROL NUMBER:		68	(KC-135A/E/R)				
	2	2.5			49421	0				T/O+0:01 #1 ENG FIRE LIGHT ILLUMINATE
	2	1.5			64110	0				T/O+0:30 PILOT'S INTERPHONE SWITCH TR
SS			MAINTENANCE EVENT CONTROL NUMBER:		69	(KC-135A/E/R)				
	2	4.7	6615005506628	GYRO	51142	1				T/O+2:00 ATTITUDE LIGHT ILLUMINATED
	2	1.0	2925002936481	EXCITER BOX	23KAA	1				T/O+1:00 #1 ENG IGNITION CIRCUIT BREA
SS			MAINTENANCE EVENT CONTROL NUMBER:		70	(KC-135A/E/R)				
	2	8.0	6610000863840	ALTIMETER	5117C	1				PILOT'S ALTIMETER READS 425 FT IN STA
SS			MAINTENANCE EVENT CONTROL NUMBER:		71	(KC-135A/E/R)				
	2	3.0	6610012277222	IFMP	51EB0	1				#4 MAIN TANK LED INOP AT LEFT HAND DI
	2	3.0	6605010182181	INU	72YB0	1				T/O+1:30 INS HAD TWO UNINITIATED TURN
SS			MAINTENANCE EVENT CONTROL NUMBER:		72	(KC-135A/E/R)				
	2	1.1	5831005384250	INTPH BOX	64110	1				IP'S INTERPHONE BOX HAS A SHORT IN TO
SS			MAINTENANCE EVENT CONTROL NUMBER:		73	(KC-135A/E/R)				
	2	3.0	6615005506628	GYRO	51142	1				T/O+1:00 PILOTS ATTITUDE INDICATOR SH

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DIG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		74	(KC-135A/E/R)				
	2	2.0	5935004834252	RCVR/XMITTER	722X0	1				T/O+2:15 RDR PICTURE SWITCHED TO 50 N
	2	6.5	5826001345977	ADI	51AHB	1				T/O+0:20 PILOT'S FLIGHT DIRECTOR GYRO
			6615005560510	RATE SWITCH GYRO	51143	1				
	2	0.5			721H0	0				T/O+0:20 DOPPLER SYSTEM GIVES ERRONEO
SS			MAINTENANCE EVENT CONTROL NUMBER:		75	(KC-135A/E/R)				
	2	1.5	5935004834252	RCVR/XMITTER	722X0	1				T/O+3:00 APN-59 RADAR WENT BLANK
SS			MAINTENANCE EVENT CONTROL NUMBER:		76	(KC-135A/E/R)				
	2	1.0			46857	0				T/O+1:00 BOOM ELEVATION GUAGE READS I
SS			MAINTENANCE EVENT CONTROL NUMBER:		77	(KC-135A/E/R)				
	2	3.0			72Y00	0				T/O+0:10 INS DUMPED POSITION AFTER TA
	2	0.5	5895000894522	RCVR/XMITTER	65BHA	1				T/O+1:00 IFF/SIF INOP, FAILS ALL IN-F
	2	1.0			72MAB	0				T/O+0:50 ASQ-15 RDR PRESS GAUGE STEAD
	2	1.5			51E00	0				T/O+0:30 FSW/CAS CRUISE, DESCENT, AND
SS			MAINTENANCE EVENT CONTROL NUMBER:		78	(KC-135A/E/R)				
	2	2.0	5895000894522	RCVR/XMITTER	65BAA	1				T/O+1:30 IFF/SIF GROUND STATION REPOR
	2	5.5			722X0	0				T/O+2:30 RDR INOPERATIVE, ZERO MAG CU
			5841006154189	WAVEGUIDE	72220	1				
SS			MAINTENANCE EVENT CONTROL NUMBER:		79	(KC-135A/E/R)				
	2	1.0			47131	0				P/F OXYGEN FLOW REGULATOR IN BOOM POD
	2	4.1	6605005320310	J4 SLV CONTRL	52420	1				T/O+0:01 COPILOT'S HSI COMPASS CARD L

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		80	(KC-135A/E/R)				
	2	1.5			46351	0				T/O:1:00 BOOM OVERRIDE SYSTEM INOPERA
SS			MAINTENANCE EVENT CONTROL NUMBER:		81	(KC-135A/E/R)				
	2	2.5	6615005506628	GYRO	51142	1				PILOT'S ATTITUDE LIGHT PRECESSED
SS			MAINTENANCE EVENT CONTROL NUMBER:		82	(KC-135A/E/R)				
	2	0.5	5826011244793	RCVR/XMITTER	72VA0	1				CB ON COPILOT'S ALTIMETER OPEN
	2	3.5			23MH0	0				#2 ENG EGT READS 25 DEGREES ABOVE OTH
	2	2.5	5826001345981	HSI	51AAD	1				COPILOT'S HSI BINDS
SS			MAINTENANCE EVENT CONTROL NUMBER:		83	(KC-135A/E/R)				
	2	0.1			9111A	0				P/F SEAL BROKEN ON BOTH SMOKE MASKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		84	(KC-135A/E/R)				
	2	2.0			46755	0				T/O:0:10 BOOM ONLY ATTAINS 10 DEGREES
	2	0.7			72CDA	0				T/O:0:10 RDR SEARCH MODE HAS MUCH DIS
	2	2.5	5930005814562	SWITCH	64112	1				T/O:4:00 PILOT'S MIKE SWITCH STICKS I
SS			MAINTENANCE EVENT CONTROL NUMBER:		85	(KC-135A/E/R)				
	2	0.5	6240002859598	LIGHT	44211	1				T/O:2:00 NOSE WHEEL LANDING LIGHT INO
SS			MAINTENANCE EVENT CONTROL NUMBER:		86	(KC-135A/E/R)				
	2	2.5	5826001745979	PITCH COMPUTER	51AD0	1				T/O:5:30 PILOT'S FLIGHT DIRECTOR SHOW
SS			MAINTENANCE EVENT CONTROL NUMBER:		87	(KC-135A/E/R)				

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	2.0	2995007397317RU	BLD VLV GOVERNOR	23LAC	1				T/O+0:50 #3 ENG BLEED VALVE STICKS AT
SS			MAINTENANCE EVENT CONTROL NUMBER:		88	(KC-135A/E/R)				
	2	2.0			46750	0				T/O+1:00 BOOM DOES NOT APPEAR TO STOW
SS			MAINTENANCE EVENT CONTROL NUMBER:		89	(KC-135A/E/R)				
	2	3.0	6615005506628	MD1 GYRO	51142	1				T/O+2:00 PILOT'S ADI GYRO WARNING FLA
SS			MAINTENANCE EVENT CONTROL NUMBER:		90	(KC-135A/E/R)				
	2	2.0	5841010537874	RCVR/XMITTER	722E0	1				T/O+0:10 RADAR PICTURE SPIKES INTERMI
SS			MAINTENANCE EVENT CONTROL NUMBER:		91	(KC-135A/E/R)				
	2	4.5	6685005155146	AIR BULB	51843	1				T/O+0:30 COPILOT'S FREE AIR TEMP GAUG
	2	3.0			61D00	0				T/O+0:30 COUPLER FAULT LIGHT ON HF RA
SS			MAINTENANCE EVENT CONTROL NUMBER:		92	(KC-135A/E/R)				
	2	2.0	5831005195883	INPH CONTL BOX	6411D	1				T/O+1:45 BOOMER'S RADIO SYSTEM HAD LO
	2	2.1			130A0	0				T/O+5:15 RIGHT MLG DOOR FAILED TO CLO
SS			MAINTENANCE EVENT CONTROL NUMBER:		93	(KC-135A/E/R)				
	2	1.2	5920010353319	RDR PWR SUPPLY	722F0	1				T/O+4:00 PILOT'S RDR SCOPE HAS NO PIC
SS			MAINTENANCE EVENT CONTROL NUMBER:		94	(KC-135A/E/R)				
	2	2.5	5920000106652	FUSE	72CBA	1				T/O+1:00 APN-69 RDR INOPERATIVE
	2	1.0	6240002839598	LIGHT	44211	1				T/O+4:20 NOSE GEAR LANDING LIGHT INOP
	2	2.6			13HAF	0				T/O+4:50 NOSE GEAR INDICATOR DOES NOT
	2	3.0			11100	0				T/O+4:30 PROBABLE LIGHTNING STRIKE ON

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		95	(KC-135A/E/R)				
	2	1.5	5831005195883	INPH CONTL BOX	6411D	1				T/O+1:00 BOOMER'S INTERPHONE ON RUDDE
	2	1.0			622A0	0				T/O+2:00 TOWER REPORTED VHF UNREADABL
	2	1.0			51E00	0				T/O+2:00 FSA/CAS PANEL CENTER OF GRAV
SS			MAINTENANCE EVENT CONTROL NUMBER:		96	(KC-135A/E/R)				
	2	6.0	6605005518187	STDBY COMPASS	51213	1				STANDBY COMPASS 120 DEGREES OUT, JAMM (REQUIRED COMPASS SWING WILL BE PE
SS			MAINTENANCE EVENT CONTROL NUMBER:		97	(KC-135A/E/R)				
	2	2.4	5920010953313	POWER SUPPLY	722F0	1				T/O+0:02 PILOT'S RDR SCOPE WENT FUZZY
SS			MAINTENANCE EVENT CONTROL NUMBER:		98	(KC-135A/E/R)				
	2	4.0			51E00	0				T/O+0:30 PILOT'S FAS/CAS TRUE AIR SPE
	2	1.5	6615005934926	INTEGRATOR	5211N	1				T/O+0:40 AUTOPILOT AILERON AXIS INOP
SS			MAINTENANCE EVENT CONTROL NUMBER:		99	(KC-135A/E/R)				
	* 3	4.0	2995007397317RU	BLD VLV GOVERNOR	23LAC	1				#3 ENG HAS LOW TRT
	3	2.0	4820008631072RU	OIL PRES RLF VLV	23JHH	1				#3 ENG OIL PRESSURE LOW
SS			MAINTENANCE EVENT CONTROL NUMBER:		100	(KC-135A/E/R)				
	2	16.0	6615005269441	AILERON FOLLOWUP	52135	1				T/O+1:00 IN APVG MODE, THE FDVG GIVES
	2	0.5			46810	0				T/O+3:00 HYD FLUID ALL OVER BOOM SIGH
SS			MAINTENANCE EVENT CONTROL NUMBER:		101	(KC-135A/E/R)				
	2	1.0			14BJC	0				T/O+4:00 RUDDER HYD PRESSURE GAUGE RE

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		102	(KC-135A/E/R)				
	2	7.0			51A00	0				T/O+1:30 COPILOT'S ATT INDICATOR STUC
	2	3.0	6615008367399	PTCH & ROLL GYRO	52110	1				T/O+1:00 AUTOPILOT TURN KNOB FUNCTION
			6605005301633	A/P GYRO	52141	1				
	2	2.7			51500	0				T/O+2:00 #1 RESERVE TANK GAUGE INTERM
SS			MAINTENANCE EVENT CONTROL NUMBER:		103	(KC-135A/E/R)				
	2	0.2	6220005833442	LIGHT	44263	1				T/O+3:00 AIRCRAFT LEFT SIDE LANDING L
SS			MAINTENANCE EVENT CONTROL NUMBER:		104	(KC-135A/E/R)				
	2	1.0			46850	0				T/O+2:00 BOOM SIGNAL SYSTEM ADVANCED
	2	3.0	5826010121938	RCVR/XMITTER	712A0	1				T/O+3:00 TACAN BROKE LOCK AND FAULT L
SS			MAINTENANCE EVENT CONTROL NUMBER:		105	(KC-135A/E/R)				
	2	7.0			52121	0				T/O+0:10 AILERON AND ELEVATOR AXIS OF
SS			MAINTENANCE EVENT CONTROL NUMBER:		106	(KC-135A/E/R)				
	2	1.5			72Y00	0				T/O+0:30 INS INU DRIFTS EXCESSIVELY
	2	4.0			51A00	0				T/O+3:50 COPILOT'S ADI GLIDESLOPE FLA
SS			MAINTENANCE EVENT CONTROL NUMBER:		107	(KC-135A/E/R)				
	2	1.0	6240002287130	LIGHT	44225	1				T/O+1:00 POSITION INDICATOR LIGHT ON
	2	1.0			44224	0				T/O+1:00 TAIL MOUNTED FLOOD LIGHT SHO
	2	2.0	6115008180183UH	GENERATOR	42211	1				T/O+0:20 COPILOT'S INSTRUMENT GENERAT
SS			MAINTENANCE EVENT CONTROL NUMBER:		108	(KC-135A/E/R)				

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	0.5	6605010182181	INU	72Y80	1				T/O+0:01 INS HAS EXCESSIVE DRIFT FOLL
	2	1.0			46850	0				T/O+1:00 BOOM SIGNAL COIL W/N RUN THR
SS			MAINTENANCE EVENT CONTROL NUMBER:		109	(KC-135A/E/R)				
	2	4.3	5841008047159	RDR CONTL BOX	722L0	1				RADAR SYSTEM INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER:		110	(KC-135A/E/R)				
	2	2.0			64112	0				T/O+0:30 NAV'S INTERPHONE BARELY AUDI
SS			MAINTENANCE EVENT CONTROL NUMBER:		111	(KC-135A/E/R)				
	2	0.5	6240002287130	LIGHT	44225	2				T/O+1:00 PDI LIGHTS ON LEFT SIDE BURN
SS			MAINTENANCE EVENT CONTROL NUMBER:		112	(KC-135A/E/R)				
	2	0.5			46310	0				T/O+2:00 HYD LEAK NEAR BOOM SIGHTING
	3	0.1			12AA0	0				T/O+4:25 BOOMER LOST PENCIL IN COCKPI
SS			MAINTENANCE EVENT CONTROL NUMBER:		113	(KC-135A/E/R)				
	2	1.0			722A0	0				RADAR STABALIZER INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER:		114	(KC-135A/E/R)				
	2	2.0	5821011948161	RECEIVER	63AC0	1				T/O+0:45 CENTER REPORTED UHF RECEPTIO
	2	0.5			1114K	0				T/O+1:00 COPILOT'S #3 WINDOW HAS TWO
SS			MAINTENANCE EVENT CONTROL NUMBER:		115	(KC-135A/E/R)				
	2	0.0			46771	0				T/O+3:00 A/R SYSTEM ADVANCED FROM REA

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Acft I.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In HRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		116	(KC-135A/E/R)				
	2	1.0			13BAB	0				LEFT SIDE STRUT ACTUATOR LEAKING
SS			MAINTENANCE EVENT CONTROL NUMBER:		117	(KC-135A/E/R)				
	2	2.0	5821001387991	RCVR/XMITTER	635A0	1				T/O+2:00 COMM #2 DOES NOT TRANSMIT ON
SS			MAINTENANCE EVENT CONTROL NUMBER:		118	(KC-135A/E/R)				
	2	3.0			46850	0				T/O+0:50 BOOM FIRES THROUGH TO A DISC
SS			MAINTENANCE EVENT CONTROL NUMBER:		119	(KC-135A/E/R)				
	2	8.5			23EE0	0				T/O+0:10 #3 THROTTLE SETTING 1 1/2 KN
	2	3.0			46840	0				T/O+2:00 BOOM HOIST MOTOR ALLOWS BOOM
SS			MAINTENANCE EVENT CONTROL NUMBER:		120	(KC-135A/E/R)				
	2	1.0			64112	0				T/O+3:00 COPILOT'S INTERPHONE SWITCH
SS			MAINTENANCE EVENT CONTROL NUMBER:		121	(KC-135A/E/R)				
	2	0.0			44225	0				T/O+1:30 PDI LIGHTS FOR TELESCOPING W
	2	1.0			11143	0				T/O+0:30 COPILOT'S #2 WINDOW MAKES WH
SS			MAINTENANCE EVENT CONTROL NUMBER:		122	(KC-135A/E/R)				
	2	3.0	6615005094814	FLIGHT CONTLR	52132	1				T/O+0:10 AUTOPILOT SYSTEM CAUSES A CO
	2	3.0			51A00	0				T/O+0:20 COPILOT'S ALTITUDE HOLD COMM
	2	3.0			52132					T/O+2:00 AUTOPILOT AILERON TURN KNOB
SS			MAINTENANCE EVENT CONTROL NUMBER:		123	(KC-135A/E/R)				
	2	2.1			72A39	0				T/O+0:05 ASA-15 SYSTEM INDICATES LOW

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	4.4	6685005267881	XMITTER	51631	1				T/O+3:30 PILOT'S RUDDER PRESSURE GAUG
SS			MAINTENANCE EVENT CONTROL NUMBER:		124	(KC-135A/E/R)				
	2	4.0			23000	0				T/O+0:01 #2 & #3 THROTTLES W/N REACH
SS			MAINTENANCE EVENT CONTROL NUMBER:		125	(KC-135A/E/R)				
	2	0.5	6240002287130	LIGHT	44225	2				T/O+0:45 LEFT ROW OF PDI LIGHTS INOPE
	2	2.5			46730	0				T/O+1:00 FORWARD A/R PUMP IN AFT BODY
SS			MAINTENANCE EVENT CONTROL NUMBER:		126	(KC-135A/E/R)				
	2	0.5			11443	0				T/O+1:00 HEAVY ICE BUILD-UP ON SIGHTI
SS			MAINTENANCE EVENT CONTROL NUMBER:		127	(KC-135A/E/R)				
	2	1.5	6610002365143CX	INDICATOR	51BD0	1				T/O+0:05 COPILOT'S ANGLE OF ATTACK IN
	2	4.5	5841007946401	CONTROL	72MAC	1				T/O+0:30 ASQ-15 SYSTEM W/N HOLD PRESS
	2	10.2	6110004839247	VOLTAGE REG	4215M	1				T/O+0:10 ELECTRICAL POWER SURGED IN A
			6115001366617UH	GENERATOR	4215L	1				
	2	2.0	1630006294222	CONTL SHIELD	13EBA	1				T/O+1:55 PILOT'S RIGHT BRAKE PEDAL MA
SS			MAINTENANCE EVENT CONTROL NUMBER:		128	(KC-135A/E/R)				
	2	0.5			11199	0				T/O+4:40 STUD ON CREW ENTRY HATCH BRO
	2	1.0			63X00	0				P/F PILOT'S RADIO RECEPTION HAS LOUD
SS			MAINTENANCE EVENT CONTROL NUMBER:		129	(KC-135A/E/R)				
	2	0.2			6411D	0				T/O+0:10 BOOMER'S INTERPHONE PANEL IN
	2	0.8	6605005501633	GYRO	52141	1				T/O+0:30 AP VG INOP ON CLIMBOUT
	2	2.5			61000	0				T/O+4:30 HF RADIO INOPERATIVE

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		130	(KC-135A/E/R)				
	2	7.0	5930010825525	RELAY	72YM0	1				T/O+0:45 DURING A/R, THE AUTOPILOT GY
SS			MAINTENANCE EVENT CONTROL NUMBER:		131	(KC-135A/E/R)				
	2	2.0	5826001345974	SLEW COUPLER	51AJ0	1				T/O+0:40 COPILOT'S HEADING-BUG CANNOT
SS			MAINTENANCE EVENT CONTROL NUMBER:		132	(KC-135A/E/R)				
	2	4.0			42156	0				T/O+3:00 #1 BUS TIE TRIPS OFF-LINE AF
	2	4.0			51A00	0				T/O+3:00 PILOT'S COMMAND BARS DID NOT
	2	1.0			1114K	0				T/O+3:00 PRESSURIZATION LEAK SOMEWHER
SS			MAINTENANCE EVENT CONTROL NUMBER:		133	(KC-135A/E/R)				
	2	1.0			23NA0	0				T/O+1:00 #3 THROTTLE KNOB OVER ONE KN
SS			MAINTENANCE EVENT CONTROL NUMBER:		134	(KC-135A/E/R)				
	3	2.5			13ECC	0				WARNING HORN CUTOUT KNOB INOP
SS			MAINTENANCE EVENT CONTROL NUMBER:		135	(KC-135A/E/R)				
	2	2.5	6130007728567NT	PWR SUPPLY	5131C	1				T/O+1:00 FUEL TRANSFER RATE INDICATIO
	2	1.0	5821011348161	RCVR/XMITTER	63AC0	1				T/O+0:20 COMM #2 SYSTEM INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER:		136	(KC-135A/E/R)				
	2	2.0			41116	0				T/O+1:30 #2 BLEED VALVE W/N CLOSE
SS			MAINTENANCE EVENT CONTROL NUMBER:		137	(KC-135A/E/R)				
	2	3.5			72MHE	0				T/O+2:00 ASQ-15 FAILED TO HOLD PRESSU

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	3.5			51E00	0				T/O+3:00 FSA/CAS DATA #1 & #4 EPR FAI
SS			MAINTENANCE EVENT CONTROL NUMBER:		138	(KC-135A/E/R)				
	2	1.2			51BE0	0				T/O+0:20 PILOT'S ANGLE OF ATTACK INDI
	2	3.0	1650008714772	CNSNT SPD DRIVE	42A37	1				T/O+0:25 #1 GENERATOR INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER:		139	(KC-135A/E/R)				
	2	2.0	6605010182181	INU	72YB0	1				T/O+6:30 INS 20 NM OFF COURSE AFTER 6
SS			MAINTENANCE EVENT CONTROL NUMBER:		140	(KC-135A/E/R)				
	2	2.0	6615005506628	MD1 GYRO	51142	1				T/O+0:30 PILOT'S ATTITUDE INDICATOR O
	2	4.0	6615005892592	AMPLIFIER	52111	1				T/O+0:30 AUTOPILOT ALTITUDE HOLD HAND
			5306008892927	ELEV SERVO MOTOR	52123	1				
SS			MAINTENANCE EVENT CONTROL NUMBER:		141	(KC-135A/E/R)				
	2	26.0	6615005269441	ELEV FOLLOWUP	52137	1				T/O+0:30 AUTOPILOT ELEVATOR AXIS OSCI
			6615005892592	AMPLIFIER	52111	1				
			5306008892927	ELEV SERVO MOTOR	52123	1				
			6615007787467	STAB TRIM ACT.	52124	1				
SS			MAINTENANCE EVENT CONTROL NUMBER:		142	(KC-135A/E/R)				
	2	1.0	6130007720567NT	PWR SUPPLY	5131C	1				T/O+4:00 ALL FOUR FUEL FLOW XMITTERS
SS			MAINTENANCE EVENT CONTROL NUMBER:		143	(KC-135A/E/R)				
	2	0.5			45161	0				T/O+4:00 #2 RESERVE BRAKE GAUGE W/N P
SS			MAINTENANCE EVENT CONTROL NUMBER:		144	(KC-135A/E/R)				

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	0.5			23MB0	0				T/O+0:01 #3 EPR GAUGE INDICATIONS SLU
	2	9.1			51111	0				T/O+0:01 TRT EXCEEDED ON ALL 4 ENGINE
	2	6.0	3010007395580HS	SHAFT	42196	1				T/O+0:13 #1 ENG FIRE LIGHT ILLUMINATE
			1650009790844	FLANGE	42174	1				
	2	1.5	4320009334697HS	HYD CHECK VLV	4511E	1				T/O+0:15 HYD LIGHT W/N STAY ILLUMINAT
	2	1.5			63XA0	0				P/F (NOT WRITTEN UP FROM PREVIOUS FLT
$S			MAINTENANCE EVENT CONTROL NUMBER:		145	(KC-135A/E/R)				
	2	2.0			23000	0				ALL FOUR ENGINES DUE POWER RUN CHECKO
$S			MAINTENANCE EVENT CONTROL NUMBER:		146	(KC-135A/E/R)				
	2	2.0	1560005049353FL	BOOM NOZZLE	46782	1				T/O+1:15 AFTER 2ND CONTACT, A/R CONTA
$S			MAINTENANCE EVENT CONTROL NUMBER:		147	(KC-135A/E/R)				
	2	4.5	5826001745976	COMPUTER	51AC0	1				T/O+4:00 PILOT'S FD-109 DID NOT GIVE
	2	1.0	6110004884189	GEN CONTL PANEL	4215K	1				T/O+4:00 #2 ENGINE BUS TIE BREAKER IL
$S			MAINTENANCE EVENT CONTROL NUMBER:		148	(KC-135A/E/R)				
	2	1.8	2915008859440	WATER PUMP	23RQA	1				T/O+0:00 #1 ENG SLOW TO TAKE WATER
			4810001779348YA	CONTL VLV	23KSN	1				
$S			MAINTENANCE EVENT CONTROL NUMBER:		149	(KC-135A/E/R)				
	2	6.2	6680005510289	PROBE	51554	1				T/O+4:00 #4 RESERVE FUEL QUANTITY IND
	2	0.2	6240002950903	LIGHT	44232	1				T/O+4:00 BOOM NOZZLE LIGHT INOPERATIV
	2	1.5			44171	0				T/O+4:00 COPILOT'S FLIGHT DIRECTOR LI
$S			MAINTENANCE EVENT CONTROL NUMBER:		150	(KC-135A/E/R)				
	2	1.0	6110004884189	GENERATOR	4215K	1				#2 GENERATOR INOPERATIVE

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		151	(KC-135A/E/R)				
	2	6.0			61DDO	0				HF COUPLER CAUSES FAULT CODE
SS			MAINTENANCE EVENT CONTROL NUMBER:		152	(KC-135A/E/R)				
	2	0.5			11000	0				T/O+0:30 BIRD STRIKE ON RIGHT SIDE OF
SS			MAINTENANCE EVENT CONTROL NUMBER:		153	(KC-135A/E/R)				
	2	0.7	5826001345975	INDICATOR	72V80	1				T/O+1:30 PILOTS RADIO ALTIMETER LIGHT
SS			MAINTENANCE EVENT CONTROL NUMBER:		154	(KC-135A/E/R)				
	2	2.0	2995007397317RU	BLD VLV GOVERNOR	23LAC	1				T/O+1:00 #3 ENG RPM INDICATION HIGH C
	2	1.5			23LAC	0				T/O+1:00 #3 ENG N/N REACH MRT DURING
	2	2.0	5930005814562	YOKE SWITCH	64112	1				P/F PILOT'S UHF ROCKER SWITCH ON YOKE
	2	4.0	6605005578206	N1 AMPLIFIER	5241F	1				T/O+0:20 N1 COMPASS 4 DEGREES IN ERRO
SS			MAINTENANCE EVENT CONTROL NUMBER:		155	(KC-135A/E/R)				
	2	1.2			51BEO	0				T/O+0:30 PILOT'S ANGLE OF ATTACK GAUG
SS			MAINTENANCE EVENT CONTROL NUMBER:		156	(KC-135A/E/R)				
	2	5.0			51A00	0				T/O+0:01 PILOT'S AND COPILOT'S RGA CO
SS			MAINTENANCE EVENT CONTROL NUMBER:		157	(KC-135A/E/R)				
	2	2.0	6615005094801	AXIS RATE SENSOR	52143	1				T/O+1:00 AUTOPILOT INDUCED PITCH OSCI
SS			MAINTENANCE EVENT CONTROL NUMBER:		158	(KC-135A/E/R)				
	2	6.0	5826001345982	FLT DIR CONTLR	51AHH	1				T/O+0:10 PILOT'S COMMAND BARS INTERMI

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DIG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		159	(KC-135A/E/R)				
	2	8.0	6615005094801	AXIS RATE SENSOR	52143	1				AUTOPILOT ELEVATOR AXIS FLUCTUATES UP
SS			MAINTENANCE EVENT CONTROL NUMBER:		160	(KC-135A/E/R)				
	2	4.8			52137	0				T/O+1:00 AUTOPILOT ELEVATOR AXIS FLUC
	2	1.0	5826001345981	HSI	51AAD	1				T/O+0:30 COPILOT'S HEADING SLEW SWITC
	2	1.0	6610005303064	INDICATOR	51421	1				T/O+0:05 LEFT INBOARD FLAP INDICATOR
SS			MAINTENANCE EVENT CONTROL NUMBER:		161	(KC-135A/E/R)				
	2	0.5	6210005426393	SWITCH	51A99	1				PILOT'S CENTRAL YOKE SLEW SWITCH MISS
SS			MAINTENANCE EVENT CONTROL NUMBER:		162	(KC-135A/E/R)				
	2	1.0			47199	0				COPILOT'S QUICK DON MICROPHONE ACTIVA
SS			MAINTENANCE EVENT CONTROL NUMBER:		163	(KC-135A/E/R)				
	2	1.0			46856	0				T/O+1:00 BOOM WOULD CYCLE THROUGH FRO
SS			MAINTENANCE EVENT CONTROL NUMBER:		164	(KC-135A/E/R)				
	2	1.5			51BE0	0				T/O+0:20 COPILOT'S ANGLE OF ATTACK GA
	2	3.0	2995007397317RU	BLD VLV GOVERNOR	23LAC	1				T/O+0:45 #1 ENG W/N REACH MRT AT TEMP
	2	2.0	2995007397317RU	BLD VLV GOVERNOR	23LHC	1				T/O+0:45 #2 ENGINE W/N ACHIEVE MRT AT
	2	1.0			23N00	0				T/O+0:20 #4 THROTTLE TOO FAR AFT OF D
	2	2.0	5841010781344	RCVR/XMITTER	721A0	1				T/O+0:50 APN-218 DOPPLER WENT INTO ME
	2	0.5	6240002287130	LIGHT	44225	3				T/O+1:00 PDI ELEVATION LIGHTS REPORTE
	2	0.5			1114A	0				T/O+1:00 BUBBLES IN BOOM SIGHTING WIN

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER: 165 (KC-135A/E/R)							
	2	2.2	6615007787467	STAB TRIM ACT.	52124	1				T/O+4:45 STAB TRIM STOPPED WORKING IN
SS			MAINTENANCE EVENT CONTROL NUMBER: 166 (KC-135A/E/R)							
	2	4.0	1680006566170FL	BOOM NOZZLE	46771	1				T/O+1:00 AFTER CONTACT WITH RECEIVER
SS			MAINTENANCE EVENT CONTROL NUMBER: 167 (KC-135A/E/R)							
	2	1.0			23BAA	0				T/O+0:01 #3 ENGINE COMPRESSOR STALLED
SS			MAINTENANCE EVENT CONTROL NUMBER: 168 (KC-135A/E/R)							
	2	1.5	5935011051187	INTPHN RECPTCL	64126	1				FORWARD GROUND INTERPHONE INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER: 169 (KC-135A/E/R)							
	2	1.2	2915002893941	CHECK VALVE	45147	1				#4 ENGINE LEAKING HYD FLUID FROM UNKN
SS			MAINTENANCE EVENT CONTROL NUMBER: 170 (KC-135A/E/R)							
	2	1.0			41130	0				T/O+1:00 BOOM WINDOW DEFROST INOP
	2	0.5			12AAJ	0				T/O+1:00 PILOT'S INERTIAL REEL LOCKS
	2	2.5	6610011519454	ICDU	51E00	1				T/O+0:30 FSA/CAS PANEL LIGHTS FADE IN
SS			MAINTENANCE EVENT CONTROL NUMBER: 171 (KC-135A/E/R)							
	2	25.0			52EU0	0				#2 MAIN TANK READS 2300 LBS LOW
			6680005264380	PANEL	51533	1				
	2	1.0	2915008859440	WATER PUMP	23RAA	1				#4 ENGINE WATER PUMP BINDING
SS			MAINTENANCE EVENT CONTROL NUMBER: 172 (KC-135A/E/R)							
	2	12.1	5306008892927	ELEV SERVO MOTOR	52123	1				T/O+2:30 AUTOPILOT ELEV/ALT HOLD AXIS

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	WRSK	MESL	Msg DTG	REMARKS
			6605005301633	GYRO	52141	1				
	2	5.5	5826001345981	HSI	51AAD	1				T/O+3:00 PILOT'S HEADING FLAG ON HSI
	2	3.5	1650008564613	CSD	42194	1				T/O+3:10 #2 GEN FREQ & KWS CONTROL RH
	2	1.0			1114A	0				T/O+0:15 BOOMER'S SIGHTING WINDOW HEA
SS			MAINTENANCE EVENT CONTROL NUMBER:		173	(KC-135A/E/R)				
	2	0.8			64115	0				T/O+0:45 BOOMER'S FORWARD INTERPHONE
SS			MAINTENANCE EVENT CONTROL NUMBER:		174	(KC-135A/E/R)				
	2	4.2	6610012278781	COMPUTER	51EC0	1				T/O+0:01 DURING CLIMBOUT FSA/CAS ICDU
	2	17.9	1650008564613	CSD	42194	1				T/O+0:45 SEVERE KWS LOAD SWAPPING NOT
	2	2.0			72200	0				T/O+1:00 RADAR WEAK AND TARGET FUZZY
	2	3.0			13000	0				T/O+5:00 WARNING HORN SOUNDED WITH TH
	2	6.2			13AA0	0				AIRCRAFT REQUIRES JACKING TO TROUBLE
SS			MAINTENANCE EVENT CONTROL NUMBER:		175	(KC-135A/E/R)				
	2	6.0	5930010853351	AIR FLOW SENSOR	72YK0	1				T/O+0:35 INS LOW AIR LIGHT ON
	2	0.5			51515	0				T/O+1:00 #3 FUEL GAUGE SHOWS ERRATIC
	2	1.0	6610000848695	RDU	51GE0	1				T/O+0:10 FSA/CAS RDU W/N DISPLAY CLIM
	2	1.0			51E00	0				T/O+1:30 FSA/CAS DATA PG 2 TRUE AIR S
	2	2.0			46755	0				T/O+1:30 BOOM TRAILED AT 33-34 DEGREE
	2	1.0			51516	0				CENTER WING & #4 MAIN TANKS READING I
SS			MAINTENANCE EVENT CONTROL NUMBER:		176	(KC-135A/E/R)				
	2	0.2			51131	0				FSA TRUE AIRSPEED INDICATOR REQUIRES
SS			MAINTENANCE EVENT CONTROL NUMBER:		177	(KC-135A/E/R)				
	2	2.9	5999008671413	RCVR/XMITTER	722A0	1				T/O+4:00 APN-59 FAILED TO HAVE ANY PR

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		178	(KC-135A/E/R)				
	2	7.0	61150013666 17UH	GENERATOR	4215L	1				T/O+0:00 #3 GENERATOR GAVE ERRATIC IN
			1650008564613	CSD	42194	1				
SS			MAINTENANCE EVENT CONTROL NUMBER:		179	(KC-135A/E/R)				
	2	33.5			51500	0				T/O+2:00 #4 MAIN TANK BURNS FASTER TH
					46000	0				
	2	7.0	611500136661 7UH	GENERATOR	4215L	1				T/O+0:00 #3 GENERATOR W/N TAKE LOAD F
			1650008564613	CSD	42194	1				
	2	2.0			46810	0				T/O+1:00 BOOM ACCUMULATOR DID NOT HOL
	2	1.0			51AA0	0				T/O+0:00 PILOT'S RGA ROTATION COMMAND
	2	1.0	5826001345977	ADI	51AAB	1				T/O+3:00 COPILOT'S NAV LOC/APP AUTO M
SS			MAINTENANCE EVENT CONTROL NUMBER:		180	(KC-135A/E/R)				
	2	2.0	6130007728567NT	PWR SUPPLY	5131C	1				T/O+0:05 FUEL FLOW READINGS LOW FOR A
	2	4.0			632AA	0				T/O+0:30 #2 COMM RADIO SQUELCH SWITCH
	2	6.0	5841008454243	GYRO	722W0	1				T/O+2:00 APN-59 NAV RADAR STAB SWITCH
SS			MAINTENANCE EVENT CONTROL NUMBER:		181	(KC-135A/E/R)				
	2	1.5	6620004159417	TRANSDUCER	23MAG	1				T/O+2:00 #3 EPR GAUGE SLOWLY BEGAN RO
SS			MAINTENANCE EVENT CONTROL NUMBER:		182	(KC-135A/E/R)				
	2	2.0			23JAH	0				T/O+0:10 #3 ENG OIL PRESSURE HAS HIGH
SS			MAINTENANCE EVENT CONTROL NUMBER:		183	(KC-135A/E/R)				
	3	8.0	000J00570-13WB	ENGINE	23000	1				T/O+3:00 #2 ENG IN FLIGHT EMERGENCY F

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Acft I.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		184	(KC-135A/E/R)				
	2	3.0	6620004459417	TRANSDUCER	23MAG	1				T/O+0:45 BLEED VALVE ON #3 ENG STICKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		185	(KC-135A/E/R)				
	2	2.2	5821012587579	RCVR/XMITTER	61DA0	1				T/O+4:00 HF RADIO UNUSABLE
	2	8.2			51E00	0				T/O+3:00 WARNING LIGHT ON FSA/CAS ILL
	2	9.5			46899	0				T/O+2:00 FUEL PANEL "XFER RATE" & "FU
			6620006212902	TRANSMITTER	51996	1				
	2	1.0			46851	0				T/O+3:00 SIGNAL AMP CIRCUIT BREAKER P
	2	0.5			46840	0				T/O+0:30 BOOM CANNOT BE LOWERED WITH
SS			MAINTENANCE EVENT CONTROL NUMBER:		186	(KC-135A/E/R)				
	2	3.0	2995006975995	SWITCH	23J99	1				T/O+2:00 #3 ENGINE LOW OIL PRESSURE L
	2	1.0			469AA	0				T/O+3:30 FIVE SECOND DELAY OCCURED DU
	2	1.0			46768	0				T/O+2:00 BOOM TRAILS AT 3 DEGREES RIG
	2	0.5			63X00	0				T/O+2:00 #1 COMM RADIO SQUELCH CUTS O
	2	1.0	5826001345981	HSI	51AAD	1				T/O+1:00 COURSE SELECTOR ON PILOT'S H
	2	1.0	5930011341357	SWITCH	64115	1				T/O+1:00 HOT MIKE AT BOOM STATION IN
	2	4.0			51AAD	0				T/O+3:00 N1 & J4 READ 5 DEGREES IN ER
	2	1.0	6615005350145	MOTOR	52121	1				T/O+2:00 AILERON AXIS OF AUTOPILOT IN
SS			MAINTENANCE EVENT CONTROL NUMBER:		187	(KC-135A/E/R)				
	2	2.0			46755	0				T/O+0:30 BOOM TRAILS AT 33 DEGREE ELE
	2	1.5			46771	0				T/O+0:30 BOOM NOZZLE HAS EXCESSIVE FU
	2	3.0			46841	0				T/O+1:00 BOOM W/N FLY UP TO STOW POSI
	2	4.0			46851	0				T/O+0:40 A/R CONTROL CIRCUIT BREAKER
SS			MAINTENANCE EVENT CONTROL NUMBER:		188	(KC-135A/E/R)				
	2	2.0			44225	0				T/O+1:00 PILOT DIRECTOR LIGHT CIRCUIT
	2	1.0			23KH0	0				T/O+4:00 #2 ENG IGNITION CIRCUIT BREA

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty.	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		189	(KC-135A/E/R)				
	2	1.8			46775	0				T/O+1:00 BOOM CONTROLS ARE VERY STIFF
SS			MAINTENANCE EVENT CONTROL NUMBER:		190	(KC-135A/E/R)				
	2	1.0			23NCR	0				T/O+0:00 STALL WARNING HORN SOUNDED W
	2	2.0			63Z00	0				T/O+0:40 UHF RADIO #2 UNREADABLE USIN
					63A00	0				
SS			MAINTENANCE EVENT CONTROL NUMBER:		191	(KC-135A/E/R)				
	2	3.0	5841008454243	GYRO	72ZH0	1				T/O+3:00 RADAR SCOPE LOST PICTURE IN
	2	4.0	5330007024715	TRANSMITTER	23MAF	1				T/O+1:00 #4 ENG OIL PRESSURE READS LO
SS			MAINTENANCE EVENT CONTROL NUMBER:		192	(KC-135A/E/R)				
	2	1.5	5925003424708	FUSE	52199	1				T/O+3:45 COPILOT'S ATTITUDE GYRO FAIL
SS			MAINTENANCE EVENT CONTROL NUMBER:		193	(KC-135A/E/R)				
	2	0.5			469D0	0				T/O+4:30 BOOM IS EXTREMELY DIFFICULT
	2	0.5			46851	0				T/O+3:00 BOOM DISCONNECT LIGHT DOES N
	2	3.0	5826001345966	RGA COMPUTER	51BH0	1				T/O+0:01 COPILOTS COMMAND BARS WENT U
SS			MAINTENANCE EVENT CONTROL NUMBER:		194	(KC-135A/E/R)				
	2	3.5	5826001345974	SLEW COUPLER	51AJ0	1				T/O+1:00 PILOT'S AND COPILOT'S HDG SL
	2	0.2			4114E	0				PILOT'S WINDSHIELD WIPER BROKEN
SS			MAINTENANCE EVENT CONTROL NUMBER:		195	(KC-135A/E/R)				
	2	8.0	6610011464953	COMPUTER	51EA0	1				T/O+1:30 MODE FUNCTION OF FSA/CAS RDN

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	3.0	6130007728567NT	PWR SUPPLY	5131C	1				T/O+3:00 OFFLOAD TOTALIZER IS INACCUR
			6680005313125	PWR SUPPLY	51914	1				
	2	1.0			46814	0				T/O+3:00 SMALL HYD LEAK OBSERVED ON B
$S			MAINTENANCE EVENT CONTROL NUMBER:		196	(KC-135A/E/R)				
	2	0.5			46854	0				T/O+1:00 BOOM SYSTEM INADVERTANTLY GO
	2	0.2			46854	0				T/O+1:00 BOOM AUTOMATICALLY DISCONNEC
	2	2.1	2915008859440	WATER PUMP	23RQA	1				T/O+0:00 $2 ENG SLOW TO TAKE WATER
	2	2.5	5895000894522	RCVR/XMITTER	65BBA	1				IFF/SIF INOPERATIVE
	2	6.0	5330007024715	CANNON PLUG	23MAF	1				T/O+1:06 $2 ENG OIL PRESSURE GAUGE FL
			6685011429716	CANNON PLUG	51399	1				
$S			MAINTENANCE EVENT CONTROL NUMBER:		197	(KC-135A/E/R)				
	2	6.8	5330007024715	TRANSMITTER	23MOF	1				T/O+1:00 $4 ENG OIL PRESSURE GAUGE FL
$S			MAINTENANCE EVENT CONTROL NUMBER:		198	(KC-135A/E/R)				
	2	15.0	5841001339183	RCVR/XMITTER	722C0	1				T/O+0:10 APN-59 RADAR PICTURE IS BLUR
$S			MAINTENANCE EVENT CONTROL NUMBER:		199	(KC-135A/E/R)				
	2	3.0			72000	0				T/O+3:00 NAVIGATOR'S RADAR INOPERATIV
					72200	0				
	2	2.5			72000	0				T/O+3:00 RADAR TILT READS 10-15 LOW F
					722H0	0				
$S			MAINTENANCE EVENT CONTROL NUMBER:		200	(KC-135A/E/R)				
	2	2.0			52410	0				T/O+1:00 N1 & J4 COMPASSES ARE OFF BY
$S			MAINTENANCE EVENT CONTROL NUMBER:		201	(KC-135A/E/R)				

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	3.0	6615005094801	AXIS RATE SENSOR	52143	1				T/O+0:45 RUDDER AXIS OF AUTOPILOT DEF
	2	9.8	6130007728567NT	PWR SUPPLY	5131C	1				T/O+2:30 BOOM OFFLOAD TOTALIZER INOPE
			6620006212902	BOOM O/L XMITTER	51911	1				
	2	2.5	6615005094801	AMPLIFIER	52143	1				T/O+0:55 AUTOPILOT ELEVATOR AXIS CAUS
	2	22.0	4320009334697HS	HYD PUMP	4511E	2				T/O+4:00 RIGHT HYD SYSTEM PRESSURE RE
			1560000987239FL	RT HYD SYS ACCUM		1				
			1560000987239FL	BOOM ACCUM		1				
			1560000987239FL	RUDDER ACCUM		1				
			4330002773274	AIR FILTER	45142	1				
			4820007172679HS	AIR PRESS REGLTR	45141	1				
	2	2.0			41126	0				T/O+2:30 CABIN PRESS MAINTAINED 1000
	2	2.0			64199	0				T/O+2:00 BROKEN WIRE AT PILOT'S NOSEW
SS			MAINTENANCE EVENT CONTROL NUMBER:		202	(KC-135A/E/R)				
	2	1.0			49410	0				T/O+0:01 WARNING HORN W/N CUT OUT WHE
	2	1.5	6615005506628	ADI	51142	1				T/O+1:20 COPILOT'S ADI INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER:		203	(KC-135A/E/R)				
	2	0.1	6240002287130	LIGHT	44225	4				T/O+1:30 PDI LIGHTS INOPERATIVE
	2	4.5			722L0	0				P/F RADAR HAS AN INTERMITTENT SWEEP
			5985010537676CH	ANTENNA	722A0	1				
	2	2.5	6620006212902	O/L TTZR XMITTER	51911	1				T/O+1:30 BOOM SYSTEM OFFLOAD TOTALIZE
SS			MAINTENANCE EVENT CONTROL NUMBER:		204	(KC-135A/E/R)				
	2	1.0	6240007637744	RDR CONTL BOX	722L0	1				T/O+0:05 SEARCH RADAR NEVER REACHED P
SS			MAINTENANCE EVENT CONTROL NUMBER:		205	(KC-135A/E/R)				
	2	2.9			5241F	0				T/O+1:00 AUTOPILOT W/N HOLD WINGS LEV

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		206	(KC-135A/E/R)				
	2	1.0			46850	0				T/O+1:00 BOOM ENGAGED LIGHT INOPERATI
SS			MAINTENANCE EVENT CONTROL NUMBER:		207	(KC-135A/E/R)				
	2	3.0			49421	0				T/O+2:45 #3 ENG HYD OVERHEAT LIGHT IL
SS			MAINTENANCE EVENT CONTROL NUMBER:		208	(KC-135A/E/R)				
	2	9.0	6615005094801	AXIS RATE SENSOR	52143	1				T/O+0:40 AUTOPILOT ALTITUDE HOLD VARI
					52113	0				
SS			MAINTENANCE EVENT CONTROL NUMBER:		209	(KC-135A/E/R)				
	2	2.0			4124A	0				T/O+0:10 CARGO COMPARTMENT TEMPERATUR
	2	1.2	5826011244793	RCVR/XMITTER	72VA0	1				T/O+0:05 PILOT'S AND COPILOT'S RADIO
	2	2.0			63W00	0				T/O+2:00 BOOMER'S #1 COMM IN BOOM COM
SS			MAINTENANCE EVENT CONTROL NUMBER:		210	(KC-135A/E/R)				
	2	0.1			52110	0				T/O+1:00 AUTOPILOT W/N HOLD HEADING I
SS			MAINTENANCE EVENT CONTROL NUMBER:		211	(KC-135A/E/R)				
	2	4.5			51312	0				T/O+0:20 #4 ENG EGT GAUGE FLUCTUATES
SS			MAINTENANCE EVENT CONTROL NUMBER:		212	(KC-135A/E/R)				
	2	7.5	5826001345976	COMPUTER	51AC0	1				PILOT'S COMMAND BARS OPPOSITE ONLY IN
	2	1.5			54BC0	0				NAV'S RGA WARNING LIGHT INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER:		213	(KC-135A/E/R)				
	2	4.1			72YN0	0				DNS BATTERY TRAY MISSING BONDING STRA

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In HRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		214	(KC-135A/E/R)				
	2	4.1	5895000894522	RCVR/XMITTER	65BAA	1				T/O+0:00 IFF AC INPUT CIRCUIT BREAKER
SS			MAINTENANCE EVENT CONTROL NUMBER:		215	(KC-135A/E/R)				
	2	2.1			72MAE	0				T/O+0:30 APN-59 RADAR W/N HOLD PRESSU
	2	1.0	6605010846834	DNC	721A0	1				T/O+0:45 DNS MALFUNCTION CODE 02-54 0
	2	0.5			63V00	0				T/O+1:00 #1 COMM RADIO FAILED TO XMIT
	2	0.2	6240002839598	LIGHT	44211	1				T/O+4:10 NOSE WHEEL LANDING LIGHT INO
SS			MAINTENANCE EVENT CONTROL NUMBER:		216	(KC-135A/E/R)				
	2	1.0			12AA0	0				T/O+0:20 INSTRUCTOR PILOT'S SEAT OFF
SS			MAINTENANCE EVENT CONTROL NUMBER:		217	(KC-135A/E/R)				
	2	0.8	6240002839598	LIGHT	44211	1				T/O+4:10 TAXI LIGHT INOPERATIVE
	2	1.0			42177	0				T/O+0:15 #3 GEN KW INDICATOR WAS WIND
	2	0.5			46822	0				T/O+3:00 EXCESSIVE AMOUNT OF HYD FLUI
SS			MAINTENANCE EVENT CONTROL NUMBER:		218	(KC-135A/E/R)				
	2	7.0			51500	0				T/O+0:40 #2 MAIN TANK FUEL INDICATOR
	2	3.0			42177	0				T/O+0:10 #3 GEN WAS LOAD SHIFTING, IS
SS			MAINTENANCE EVENT CONTROL		219	(KC-135A/E/R)				
	2	15.8	1650008564613	CSD	2194	1				T/O+0:30 #3 GEN AD LARGE SWAPPING LOA
			4920007018626RU	DUCT	42163	2				
SS			MAINTENANCE EVENT CONTROL NUMBER:		220	(KC-135A/E/R)				

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In HRSK	MESL	Msg DTG	REMARKS
	2	2.5			23NAO	0				T/O+0:10 THROTTLES 1 & 4 ARE 2-3 KNOB
$S			MAINTENANCE EVENT CONTROL NUMBER:		221	(KC-135A/E/R)				
	2	12.0			23R00	0				MAIN WATER TANK HAS LEAK
$S			MAINTENANCE EVENT CONTROL NUMBER:		222	(KC-135A/E/R)				
	2	3.0	5826001345973	AMPLIFIER	51AB0	1				T/O+5:00 COPILOT'S ATTITUDE WARNING A
$S			MAINTENANCE EVENT CONTROL NUMBER:		223	(KC-135A/E/R)				
	2	5.5			23NAD	0				T/O+4:00 #1 ENG LAGS BEHIND ALL OTHER
$S			MAINTENANCE EVENT CONTROL NUMBER:		224	(KC-135A/E/R)				
	2	2.5	6615005506628	MD1 GYRO	51142	1				T/O+0:30 COPILOT'S ALTITUDE INDICATOR
$S			MAINTENANCE EVENT CONTROL NUMBER:		225	(KC-135A/E/R)				
	3	3.5			65BAA	0				PART REMOVED AND REINSTALLED AS CANNI
$S			MAINTENANCE EVENT CONTROL NUMBER:		226	(KC-135A/E/R)				
	2	1.5			46851	0				T/O+1:02 BOOM SIGNAL COIL INOP ON FIR
	2	0.5			46782	0				T/O+1:05 CONSIDERABLE AMOUNT OF FUEL
	2	2.0			63HC0	0				T/O+1:10 HAVE QUICK RADIO INOPERATIVE
	2	1.5			72200	0				T/O+1:15 RADAR HAS ONE EXTRA RANGE MA
$S			MAINTENANCE EVENT CONTROL NUMBER:		227	(KC-135A/E/R)				
	2	1.0			61DC0	0				T/O+1:00 HG RADIO WON'T RECEIVE OR TR

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		228	(KC-135A/E/R)				
	2	1.5			65BCA	0				T/O+3:20 #2 DIGIT FOR THE MODE 3/A SL
SS			MAINTENANCE EVENT CONTROL NUMBER:		229	(KC-135A/E/R)				
	2	4.0			51EB0	0				CENTER WING LINE VALVE LIGHT INOP IN
	2	4.0			51AJC	0				COPILOT'S SLEW BUG MOVES LEFT WITH OU
SS			MAINTENANCE EVENT CONTROL NUMBER:		230	(KC-135A/E/R)				
	2	2.2			23H00	0				#1 ENG OIL PRESSURE INDICATOR READS H
SS			MAINTENANCE EVENT CONTROL NUMBER:		231	(KC-135A/E/R)				
	2	2.0			23JAH	0				T/O+0:01 #1 ENG OIL PRESSURE READ BET
	2	1.0	5841010537874	INDICATOR	722E0	1				T/O+1:00 RADAR SHOWS A MIRROR IMAGE B
	2	1.0	5841010781344	ELEMENT	721B0	1				T/O+1:30 LED ELEMENT ON DOPPLER GUIDA
SS			MAINTENANCE EVENT CONTROL NUMBER:		232	(KC-135A/E/R)				
	2	6.8	6615005506628	MD1 GYRO	511-12	1				T/O+0:30 PILOT'S ADI GYRO FLAG APPEAR
	2	5.7	4820008409141FL	RELIEF VALVE	72MAE	1				T/O+1:00 NAV'S SCOPE DISPLAYED SPECKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		233	(KC-135A/E/R)				
	2	2.2			61000	0				T/O+1:00 HF RADIO INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER:		234	(KC-135A/E/R)				
	2	0.2			45175	0				RIGHT SIDE HYD AUXILARY PUMP FAILS TO
SS			MAINTENANCE EVENT CONTROL NUMBER:		235	(KC-135A/E/R)				
	2	2.0	5985011041424CX	HF COUPLER	61000	1				HF COUPLER FAULT LIGHT REMAINS ON AFT

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		236	(KC-135A/E/R)				
	2	2.0	5821012587579	RCVR/XMITTER	61DA0	1				T/O+0:30 HF COUPLER LIGHTS CAME ON WH
SS			MAINTENANCE EVENT CONTROL NUMBER:		237	(KC-135A/E/R)				
	2	1.0			51E00	0				T/O+0:05 FSA/CAS HAS A BIT BALL INDIC
SS			MAINTENANCE EVENT CONTROL NUMBER:		238	(KC-135A/E/R)				
	2	11.5	6615008367399	GYRO	52110	1				T/O+0:30 AUTOPILOT AILERON AXIS DID N
			1560000987239FL	AMPLIFIER	5211A	1				
SS			MAINTENANCE EVENT CONTROL NUMBER:		239	(KC-135A/E/R)				
	2	2.0			52110	0				T/O+0:40 AILERON AXIS ERRATIC
SS			MAINTENANCE EVENT CONTROL NUMBER:		240	(KC-135A/E/R)				
	2	1.0			46811	0				T/O+1:00 HYD FLUID LEAKING FROM BOOM
	2	3.0			722L0	0				T/O+0:10 APN-59 RADAR TILT UNRELIABLE
	2	1.3			47130	0				T/O+0:30 INSTRUCTOR'S OXYGEN ON/OFF L
SS			MAINTENANCE EVENT CONTROL NUMBER:		241	(KC-135A/E/R)				
	2	2.8			72YR0	0				T/O+0:40 PILOT COULD NOT SELECT INS H
SS			MAINTENANCE EVENT CONTROL NUMBER:		242	(KC-135A/E/R)				
	2	1.8	5826010124864	CONVERTER	71ZB0	1				T/O+0:01 TACAN SELF TEST FAILED
	2	4.0			46775	0				T/O+1:00 BOOM HAS LOUD BANGING NOISE
	2	8.0	6615005269441	SYNCHRO	52135	1				T/O+0:45 AUTOPILOT AILERON AXIS WON'T

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		243	(KC-135A/E/R)				
	2	2.8			44225	0				T/O+1:30 RECEIVER LIGHTS W/N GIVE "UP
SS			MAINTENANCE EVENT CONTROL NUMBER:		244	(KC-135A/E/R)				
	2	12.0	5306008892927	SERVO MOTOR	52123	1				T/O+0:05 (REPEAT) RUDDER PEDALS FLUTT
	2	3.2			63XH0	0				T/O+0:05 #1 COMM RADIO HAS STATIC CLI
	2	2.8	6610012173578	BSIU	51EE0	1				T/O+0:30 DNS DRIFT READS 10 DEGREES R
	2	10.0	6615005350155	ELEV SERVO MOTOR	52123	1				T/O+4:15 ELEVATOR AXIS INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER:		245	(KC-135A/E/R)				
	2	1.0			721B0	0				P/F DOPPLER W/N INITIATE DURING PREFL
SS			MAINTENANCE EVENT CONTROL NUMBER:		246	(KC-135A/E/R)				
	2	0.2			64000	0				QUICK DON ON PILOT'S SIDE MICROPHONE
SS			MAINTENANCE EVENT CONTROL NUMBER:		247	(KC-135A/E/R)				
	2	1.5			71BB0	0				P/F PILOT'S INTERPHONE MONITOR COULD
SS			MAINTENANCE EVENT CONTROL NUMBER:		248	(KC-135A/E/R)				
	2	1.0			51840	0				T/O+2:00 NAV'S TEMP INDICATOR HAS 3-5
	2	1.0	6610012173518	BSIU	51EE0	1				T/O+1:00 FSAS DISPLAYING NO NAV FUEL
	2	0.8			1114H	0				T/O+0:30 COPILOT'S #1 WINDSCREEN HAS
	2	1.0	6240010452095	CDU	72YC0	1				T/O+1:00 NAV INS/DNS DISPLAY "H" INDI
SS			MAINTENANCE EVENT CONTROL NUMBER:		249	(KC-135A/E/R)				
	2	1.5	1660012409042	TEMP CONTROL	4121B	1				T/O+0:05 COCKPIT TEMPERATURE CONTROL

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		250	(KC-135A/E/R)				
	2	1.0			72YB0	0				T/O+2:00 INS W/N TAKE TACAN UPDATE
SS			MAINTENANCE EVENT CONTROL NUMBER:		251	(KC-135A/E/R)				
	2	1.5			4514C	0				T/O+3:00 LOST LEFT HYD SYSTEM IN FLIG
SS			MAINTENANCE EVENT CONTROL NUMBER:		252	(KC-135A/E/R)				
	2	4.0	6615011564148	J4 GYRO	5242B	1				T/O+0:15 J4 COMPASS OFF BY 6 DEGREES
			6605008329691	CONTROL PANEL	5242C	1				
SS			MAINTENANCE EVENT CONTROL NUMBER:		253	(KC-135A/E/R)				
	2	5.1	6610012277222	BULB	51EB0	1				T/O+4:16 #1 MAIN TANK ENG MANIFOLD VA
	2	21.0	5306008892927	ELEV SERVO MOTOR	52123	1				T/O+1:20 AUTOPILOT ELEVATOR AXIS, WHE
			6615005094814	FLIGHT CONTRLR	52132	1				
	2	1.0			4215M	0				T/O+0:00 #2 BUS TIE TRIPPED UPON ENGI
SS			MAINTENANCE EVENT CONTROL NUMBER:		254	(KC-135A/E/R)				
	2	2.0	5821011948161	RCVR/XMITTER	632HA	1				T/O+1:00 #2 COMM RADIO HAS INTERMITTE
SS			MAINTENANCE EVENT CONTROL NUMBER:		255	(KC-135A/E/R)				
	2	0.8	6620000784470	TRANSDUCER	23MAD	1				T/O+1:30 #1 ENG EPR GAUGE ROTATED APP
SS			MAINTENANCE EVENT CONTROL NUMBER:		256	(KC-135A/E/R)				
	2	7.5	5306001511414	SERVO MOTOR	52124	1				T/O+2:20 AUTOPILOT ELEVATOR AXIS WENT
SS			MAINTENANCE EVENT CONTROL NUMBER:		257	(KC-135A/E/R)				

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	0.5			12C8A	0				T/O+0:45 NAV APN-69 INOPERATIVE
	2	0.5	6615005892592	RECTIFIER	52111	2				T/O+0:30 ELEVATOR AXIS DOES NOT RESPO
SS			MAINTENANCE EVENT CONTROL NUMBER:		258	(KC-135A/E/R)				
	2	22.9			6411D	0				T/O+0:15 INCOMING TRANSMISSIONS AND I
SS			MAINTENANCE EVENT CONTROL NUMBER:		259	(KC-135A/E/R)				
	2	0.5			51EC0	0				T/O+1:20 FSA DISPLAYED FMS FAIL ERROR
SS			MAINTENANCE EVENT CONTROL NUMBER:		260	(KC-135A/E/R)				
	2	2.5			722A0	0				T/O+1:00 PILOT AND NAV RADAR SHOWS TH
SS			MAINTENANCE EVENT CONTROL NUMBER:		261	(KC-135A/E/R)				
	2	1.0			51AA0	0				T/O+0:01 PILOT'S COURSE KNOB ON FLIGH
SS			MAINTENANCE EVENT CONTROL NUMBER:		262	(KC-135A/E/R)				
	2	1.0			51EB0	0				T/O+2:30 #2 MAIN FUEL TANK AFT BOOST
SS			MAINTENANCE EVENT CONTROL NUMBER:		263	(KC-135A/E/R)				
	2	9.0			72C8A	0				T/O+0:30 COULD NOT PAINT APN-69 BEACO
SS			MAINTENANCE EVENT CONTROL NUMBER:		264	(KC-135A/E/R)				
	2	6.0			63HC0	0				#1 UHF INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER:		265	(KC-135A/E/R)				
	2	8.8	6240007637744	POTENTIOMETER	722L0	1				T/O+0:03 APN-59 PICTURE AVAILABLE ONL

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		266	(KC-135A/E/R)				
	2	2.0			51116	0				T/O+0:10 NAV'S TRUE AIR SPEED INDICAT
SS			MAINTENANCE EVENT CONTROL NUMBER:		267	(KC-135A/E/R)				
	2	0.5			72YC0	0				T/O+3:00 NAV'S CDU W/N TAKE WAYPOINT
SS			MAINTENANCE EVENT CONTROL NUMBER:		268	(KC-135A/E/R)				
	2	0.5			5131C	0				T/O+0:10 ALL FUEL FLOW GAUGES READ LO
	2	0.5			5241F	0				T/O+0:30 AUTOPILOT W/N HOLD HEADING.
SS			MAINTENANCE EVENT CONTROL NUMBER:		269	(KC-135A/E/R)				
	2	1.0			65BAA	0				IFF W/N SELF TEST
SS			MAINTENANCE EVENT CONTROL NUMBER:		270	(KC-135A/E/R)				
	2	2.0			64110	0				T/O+0:30 INSTRUCTOR'S INTERPHONE PANE
SS			MAINTENANCE EVENT CONTROL NUMBER:		271	(KC-135A/E/R)				
	2	3.5			722E0	0				T/O+0:05 RADAR SPIKES ABOUT EVERY 20
	2	0.5			51142	0				T/O+0:30 PILOT'S ADI SHOWED CONSTANT
SS			MAINTENANCE EVENT CONTROL NUMBER:		272	(KC-135A/E/R)				
	2	1.0			52113	0				T/O+0:45 AUTOPILOT AILERON AXIS KNOB
SS			MAINTENANCE EVENT CONTROL NUMBER:		273	(KC-135A/E/R)				
	2	1.0	5826001345974	GYRO	51AAE	1				T/O+0:10 PILOT'S RATE OF TURN FLAG RE

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0

Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		274	(KC-135A/E/R)				
	2	1.5			51AAD	0				T/O+3:00 COPILOT'S HSI HEADING FLAG C
SS			MAINTENANCE EVENT CONTROL NUMBER:		275	(KC-135A/E/R)				
	2	1.0			52134	0				T/O+0:30 ALTITUDE HOLD DOES NOT HOLD
	2	2.5			712A0	0				T/O+1:30 TACAN RED LIGHT CAME ON AND
SS			MAINTENANCE EVENT CONTROL NUMBER:		276	(KC-135A/E/R)				
	2	0.5			51AAA	0				T/O+0:30 COPILOT'S ALTITUDE HOLD ON F
SS			MAINTENANCE EVENT CONTROL NUMBER:		277	(KC-135A/E/R)				
	2	0.5			51AB0	0				T/O+0:30 PILOT'S ADI GYRO FLAG IN VIE
SS			MAINTENANCE EVENT CONTROL NUMBER:		278	(KC-135A/E/R)				
	2	5.0			51142	0				T/O+2:00 FLIGHT DIRECTOR ATTITUDE LIG
SS			MAINTENANCE EVENT CONTROL NUMBER:		279	(KC-135A/E/R)				
	2	0.2			51142	0				T/O+1:00 PILOTS ATTITUDE INDICATOR SH
SS			MAINTENANCE EVENT CONTROL NUMBER:		280	(KC-135A/E/R)				
	2	10.8	5920011380-186	POWER SUPPLY	722X0	1				T/O+0:15 RADAR PICTURE AT 50 NM RANGE
	2	1.8			51143	0				T/O+0:20 PILOT'S FLIGHT DIRECTOR GYRO
SS			MAINTENANCE EVENT CONTROL NUMBER:		281	(KC-135A/E/R)				
	2	0.5			65BAA	0				T/O+1:30 IFF/SIF GROUND STATION REPOR

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	4.5			722X0	0				T/O+2:30 RADAR INOP WITH ZERO MAGNETI
SS			MAINTENANCE EVENT CONTROL NUMBER:		282	(KC-135A/E/R)				
	2	0.2			722X0	0				T/O+0:05 RADAR SYSTEM INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER:		283	(KC-135A/E/R)				
	2	4.0			5242D	0				T/O+1:20 COPILOT'S HSI COMPASS CARD L
SS			MAINTENANCE EVENT CONTROL NUMBER:		284	(KC-135A/E/R)				
	2	2.0			51A00	0				T/O+5:30 PILOT'S FLIGHT DIRECTOR SHOW
SS			MAINTENANCE EVENT CONTROL NUMBER:		285	(KC-135A/E/R)				
	2	3.0			52411	0				T/O+0:30 N1 COMPASS LAGGED 8 DEGREES
SS			MAINTENANCE EVENT CONTROL NUMBER:		286	(KC-135A/E/R)				
	2	1.0			51142	0				T/O+2:00 PILOT'S ADI GYRO WARNING FLA
SS			MAINTENANCE EVENT CONTROL NUMBER:		287	(KC-135A/E/R)				
	2	8.0			722E0	0				T/O+1:10 RADAR PICTURE SPIKES INTERMI
SS			MAINTENANCE EVENT CONTROL NUMBER:		288	(KC-135A/E/R)				
	2	4.5			51343	0				T/O+0:30 COPILOT'S FREE AIR TEMP GAUG
SS			MAINTENANCE EVENT CONTROL NUMBER:		289	(KC-135A/E/R)				
	2	7.2			610A0	0				HF RADIO HAS INTERMITTENT FAULT LIGHT

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		290	(KC-135A/E/R)				
	2	6.5			6411D	0				T/O+1:45 BOOM RADIO SYSTEM HAD LOUD A
SS			MAINTENANCE EVENT CONTROL NUMBER:		291	(KC-135A/E/R)				
	2	8.5	5920010953319	AMPLIFIER	722F0	1				T/O+4:00 PILOT'S RADAR SCOPE HAD NO P
SS			MAINTENANCE EVENT CONTROL NUMBER:		292	(KC-135A/E/R)				
	2	2.2			6411D	0				T/O+1:00 BOOM INTERPHONE SWITCH STICK
SS			MAINTENANCE EVENT CONTROL NUMBER:		293	(KC-135A/E/R)				
	2	0.2			51213	0				STANDBY COMPASS STUCK AT 240 DEGREE M
SS			MAINTENANCE EVENT CONTROL NUMBER:		294	(KC-135A/E/R)				
	2	4.0	5831005195883	RELAY	6411D	1				INTERPHONE BOX CALL RELAY STICKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		295	(KC-135A/E/R)				
	2	5.0			722F0	0				T/O+1:00 PILOT'S RADAR SCOPE WENT FUZ
SS			MAINTENANCE EVENT CONTROL NUMBER:		296	(KC-135A/E/R)				
	2	2.0			52135	0				T/O+1:00 AUTOPILOT VG MODE GIVES 4 DE
SS			MAINTENANCE EVENT CONTROL NUMBER:		297	(KC-135A/E/R)				
	2	1.0			712A0	0				T/O+3:30 TACAN BROKE LOCK AND FAULT L
SS			MAINTENANCE EVENT CONTROL NUMBER:		298	(KC-135A/E/R)				

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	0.5			72YH0	0				T/O+0:00 INS HAS EXCESSIVE DRIFT FOLL
$S			MAINTENANCE EVENT CONTROL NUMBER:		299	(KC-135A/E/R)				
	2	1.5			632AA	0				T/O+0:45 CENTER REPORTED COMM #2 TRAN
$S			MAINTENANCE EVENT CONTROL NUMBER:		300	(KC-135A/E/R)				
	2	4.8	5821001387931	CNTRL ADAPT BOX	635H0	1				T/O+2:00 #2 COMM DOES NOT TRANSMIT ON
$S			MAINTENANCE EVENT CONTROL NUMBER:		301	(KC-135A/E/R)				
	2	2.0			635A0	0				#2 COMM WON'T RECEIVE IN GUARD POSITI
$S			MAINTENANCE EVENT CONTROL NUMBER:		302	(KC-135A/E/R)				
	2	0.2			52132	0				T/O+0:10 AUTOPILOT FLIES IN A CONSTAN
	2	0.5			52132	0				T/O+2:00 AUTOPILOT AILERON TURN KNOB
$S			MAINTENANCE EVENT CONTROL NUMBER:		303	(KC-135A/E/R)				
	2	13.3			722XE	0				RADAR T-DECK MAGNETIC CURRENT INTERMI
$S			MAINTENANCE EVENT CONTROL NUMBER:		304	(KC-135A/E/R)				
	2	0.5			51BD0	0				T/O+0:30 COPILOT'S ANGLE OF ATTACK IN
$S			MAINTENANCE EVENT CONTROL NUMBER:		305	(KC-135A/E/R)				
	2	1.0			52141	0				T/O+0:30 AUTOPILOT VG MODE INOPERATIV
$S			MAINTENANCE EVENT CONTROL NUMBER:		306	(KC-135A/E/R)				
	2	9.2			65BHC	0				IFF/SIF MODE 4 CAUTION LIGHT W/N GO A

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		307	(KC-135A/E/R)				
	2	1.0			65BAC	0				IFF/SIF CAUTION LIGHT W/N ILLUMINATE
SS			MAINTENANCE EVENT CONTROL NUMBER:		308	(KC-135A/E/R)				
	2	0.8			5131C	0				T/O+1:00 FUEL XFER AND FUEL XFER RATE
	2	1.2			632AA	0				T/O+0:20 CREW CAN'T HEAR OTHER MEMBER
SS			MAINTENANCE EVENT CONTROL NUMBER:		309	(KC-135A/E/R)				
	2	0.5			72YB0	0				T/O+5:00 INS 20 NM OFF COURSE AFTER 6
SS			MAINTENANCE EVENT CONTROL NUMBER:		310	(KC-135A/E/R)				
	2	4.5			52123	0				T/O+0:30 AUTOPILOT ALTITUDE HOLD WAND
SS			MAINTENANCE EVENT CONTROL NUMBER:		311	(KC-135A/E/R)				
	2	5.5			52123	0				T/O+0:30 AUTOPILOT ELEVATOR AXIS OSCI
SS			MAINTENANCE EVENT CONTROL NUMBER:		312	(KC-135A/E/R)				
	2	0.5			5131C	0				T/O+4:00 ALL FOUR FUEL FLOW XMITTERS
SS			MAINTENANCE EVENT CONTROL NUMBER:		313	(KC-135A/E/R)				
	2	7.0			63WC0	0				#1 UHF W/N TRANSMIT
SS			MAINTENANCE EVENT CONTROL NUMBER:		314	(KC-135A/E/R)				
	2	2.5			722L0	0				RADAR TILT KNOB LOOSE ON CONTROL BOX

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
$S			MAINTENANCE EVENT CONTROL NUMBER:		315	(KC-135A/E/R)				
	2	0.1			72V80	0				T/O+1:30 PILOT'S RADIO ALTIMETER LIGH
$S			MAINTENANCE EVENT CONTROL NUMBER:		316	(KC-135A/E/R)				
	2	1.5			5241F	0				T/O+0:20 N1 COMPASS 4 DEGREES IN ERRO
$S			MAINTENANCE EVENT CONTROL NUMBER:		317	(KC-135A/E/R)				
	2	0.1			52143	0				T/O+1:00 AUTOPILOT INDUCED PITCH OSCI
$S			MAINTENANCE EVENT CONTROL NUMBER:		318	(KC-135A/E/R)				
	2	1.0			51AAA	0				T/O+0:10 PILOT'S COMMAND BARS INTERMI
$S			MAINTENANCE EVENT CONTROL NUMBER:		319	(KC-135A/E/R)				
	2	1.0			51AAD	0				T/O+0:30 COPILOT'S HEADING SLEW SWITC
	2	1.0			51421	0				T/O+0:05 LEFT INBOARD FLAP INDICATOR
$S			MAINTENANCE EVENT CONTROL NUMBER:		320	(KC-135A/E/R)				
	2	8.0			72180	0				T/O+0:50 APN-218 DOPPLER WENT INTO ME
$S			MAINTENANCE EVENT CONTROL NUMBER:		321	(KC-135A/E/R)				
	2	0.5			52123	0				T/O+2:30 AUTOPILOT ELEV ALTITUDE HOLD
	2	0.9			51AAD	0				T/O+3:00 PILOT'S HEADING FLAG ON HSI
$S			MAINTENANCE EVENT CONTROL NUMBER:		322	(KC-135A/E/R)				
	2	9.0			72280	0				T/O+4:00 APN-59 FAILED TO HAVE ANY PR

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In HRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		323	(KC-135A/E/R)				
	2	0.2			51AAB	0				T/O+3:00 COPILOT'S NAV LOC/APP AUTO M
SS			MAINTENANCE EVENT CONTROL NUMBER:		324	(KC-135A/E/R)				
	2	1.0			5131C	0				T/O+0:05 FUEL FLOW READINGS LOW FOR A
SS			MAINTENANCE EVENT CONTROL NUMBER:		325	(KC-135A/E/R)				
	2	0.2			23MAG	0				T/O+0:45 BLEED VALVE ON #3 ENG STICKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		326	(KC-135A/E/R)				
	2	2.0	5821011038155	PANEL ASSEMBLY	61DC0	1				HF CONTROL ON/OFF SWITCH BROKEN
SS			MAINTENANCE EVENT CONTROL NUMBER:		327	(KC-135A/E/R)				
	2	0.5	5826001345981	HSI	51AHD	1				T/O+3:00 N1 & J4 COMPASSES READ 5 DEG
	2	1.5			635H0	0				T/O+4:30 GUARD ON #2 COMM DOES NOT WO
	2	1.0			52121	0				T/O+2:00 AILERON AXIS OF AUTOPILOT CA
SS			MAINTENANCE EVENT CONTROL NUMBER:		328	(KC-135A/E/R)				
	2	3.5			632AA	0				#2 COMM TRANSMITS AND RECEIVES INTERM
SS			MAINTENANCE EVENT CONTROL NUMBER:		329	(KC-135A/E/R)				
	2	0.8			51BA0	0				T/O+0:01 COPILOT'S COMMAND BARS WENT
SS			MAINTENANCE EVENT CONTROL NUMBER:		330	(KC-135A/E/R)				
	2	0.5			5131C	0				T/O+3:00 OFFLOAD TOTALIZER IS INACCUR

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		331	(KC-135A/E/R)				
	2	1.5	6615005094801	GYRO	52143	1				T/O+0:45 RUDDER AXIS OF AUTOPILOT CON
	2	0.5			5131C	0				T/O+2:30 OFFLOAD TOTALIZER INOPERATIV
	2	0.8			52111	0				T/O+0:55 AUTOPILOT ELEV AXIS CAUSING
SS			MAINTENANCE EVENT CONTROL NUMBER:		332	(KC-135A/E/R)				
	2	4.0			722A0	0				P/F RADAR HAS INTERMITTENT SWEEP
SS			MAINTENANCE EVENT CONTROL NUMBER:		333	(KC-135A/E/R)				
	2	13.0			722L0	0				T/O+0:05 SEARCH RADAR NEVER REACHED B
SS			MAINTENANCE EVENT CONTROL NUMBER:		334	(KC-135A/E/R)				
	2	0.2			52143	0				T/O+0:40 AUTOPILOT ALTITUDE HOLD VARI
SS			MAINTENANCE EVENT CONTROL NUMBER:		335	(KC-135A/E/R)				
	2	0.5			52111	0				T/O+0:05 AUTOPILOT AILERON AXIS UNUSA
SS			MAINTENANCE EVENT CONTROL NUMBER:		336	(KC-135A/E/R)				
	2	5.8			65BCA	0				T/O+0:01 IFF AC INPUT CIRCUIT BREAKER
SS			MAINTENANCE EVENT CONTROL NUMBER:		337	(KC-135A/E/R)				
	2	1.0			632HA	0				T/O+3:00 #2 COMM RADIO HAS A LOUD SQU
SS			MAINTENANCE EVENT CONTROL NUMBER:		338	(KC-135A/E/R)				
	2	1.0			51AB0	0				T/O+5:00 COPILOT'S ATTITUDE WARNING A

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		339	(KC-135A/E/R)				
	2	4.0			51142	0				T/O+0:30 COPILOT'S ALTITUDE INDICATOR
SS			MAINTENANCE EVENT CONTROL NUMBER:		340	(KC-135A/E/R)				
	2	2.0			51142	0				T/O+0:30 PILOT'S ADI GYRO FLAG APPEAR
SS			MAINTENANCE EVENT CONTROL NUMBER:		341	(KC-135A/E/R)				
	2	3.0			61DD0	0				HF COUPLER LIGHT REMAINS ON AFTER SEL
SS			MAINTENANCE EVENT CONTROL NUMBER:		342	(KC-135A/E/R)				
	2	0.5			722L0	0				T/O+0:10 APN-59 RADAR TILT UNRELIABLE
SS			MAINTENANCE EVENT CONTROL NUMBER:		343	(KC-135A/E/R)				
	2	0.5			712B0	0				T/O+0:01 TACAN SELF TEST FAILED INFLI
SS			MAINTENANCE EVENT CONTROL NUMBER:		344	(KC-135A/E/R)				
	2	3.1			52144	0				AUTOPILOT AXIS RATE SENSOR HAS NO ROL
SS			MAINTENANCE EVENT CONTROL NUMBER:		345	(KC-135A/E/R)				
	2	8.0			71BHH	0				PILOT'S INTERPHONE VOLUME LEVEL HIGH
SS			MAINTENANCE EVENT CONTROL NUMBER:		346	(KC-135A/E/R)				
	2	4.0			52143	0				T/O+1:00 AUTOPILOT RUDDER AXIS OSCILL
SS			MAINTENANCE EVENT CONTROL NUMBER:		347	(KC-135A/E/R)				

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	1.5			52122	0				T/O+0:05 RUDDER PEDALS FLUTTER WITH R
	2	0.5			52123	0				T/O+4:15 AUTOPILOT ELEVATOR AXIS INOP
SS			MAINTENANCE EVENT CONTROL NUMBER:		348	(KC-135A/E/R)				
	2	0.5			51EE0	0				T/O+1:00 FSAS DISPLAYING NO NAV FUEL
	2	0.5			72YC0	0				T/O+1:00 NAV INS/DNS DISPLAY "W" INDI
SS			MAINTENANCE EVENT CONTROL NUMBER:		349	(KC-135A/E/R)				
	2	4.0			5242C	0				T/O+0:15 J4 COMPASS 6 DEGREES IN ERRO
SS			MAINTENANCE EVENT CONTROL NUMBER:		350	(KC-135A/E/R)				
	2	4.5			52132	0				T/O+1:20 AUTOPILOT ELEVATOR AXIS WOUL
SS			MAINTENANCE EVENT CONTROL NUMBER:		351	(KC-135A/E/R)				
	2	2.0			632AA	0				T/O+1:00 #2 COMM WAS INTERMITTENTLY G
SS			MAINTENANCE EVENT CONTROL NUMBER:		352	(KC-135A/E/R)				
	2	5.0			52124	0				T/O+1:30 AUTOPILOT ELEV AXIS WENT FUL

Appendix B: Information Guide

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List of Figures

List of Tables

KC-135/A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE INFORMATION GUIDE (Hall, 1989:Ap B)

Introduction

1. The KC-135A/E/R Aircraft Maintenance Database and its associated worksheets and instructions were developed to make response cell play more realistic during command post exercises. The database places aircraft availability at realistic levels without impeding other objectives at higher echelons of exercise play. Additionally, realistic demands for aircraft parts are generated. The database information can be viewed as the information a battle staff would normally receive from the aircraft readiness center.

2. Information for the database was derived from data gathered during routine European tanker task force flying missions. Therefore, the data is based upon actual aircraft maintenance in support of flying operations. The database can be expected to produce results consistent with realistic occurrences. However, the results during your particular exercise will be dependent upon the taskings you receive.

3. The information and guidance on the following pages is to help you use the database as well as determine other factors which have a direct bearing on your aircraft availability and parts requirements.

4. Remember that you will face many problems and challenges in this exercise. In most cases, they are the same problems and challenges that your unit could expect to face in an actual deployment. Work as diplomatically as possible with your host unit to resolve problems. The database should help you keep your thoughts focused along these lines. Make sure you share the things you learn with your home unit so they can be better prepared for deployment.

Overview

This information guide will help you:

1. Understand the structure and use of the database.

2. Initially set up your aircraft worksheets.

3. Document the CPX MX Worksheets 1 and 2.

4. Determine aircraft downtime and availability.

5. Determine parts required and their availability in the war readiness spares kit (WRSK).

I. The Database Format

The columns of the database are as follows:

Maintenance Event Control Number - The control number is used to identify a "maintenance event" for a particular aircraft on the CPX MX Worksheets 1 and 2. A maintenance event includes all the lines in the database associated with a specific maintenance event control number. It also provides a means of record keeping for later analysis.

Acft T.N. - The aircraft tail number to which the maintenance event is assigned is entered in this block (by the user).

Lndg Code - Identifies the maintenance condition of an aircraft returning from a mission.

Code 1: Aircraft/system(s) fully operational. Aircraft is landing with no known discrepancies which would adversely affect performance of the aircraft/system(s).

Code 2: Aircraft/system(s) has/have minor discrepancies which may affect operating performance but will generally not preclude the aircraft from flying another mission prior to repair.

Code 3: Aircraft/system(s) has/have discrepancies which render the aircraft and/or system(s) unusable. Generally, aircraft are not flown until Code 3 discrepancies are repaired.

Fix Time - The time needed to repair a discrepancy listed in the database. The times listed do not include normal refuel, phase, HPO, preflight/thruflight/postflight inspection. (Time in hours to the nearest tenth) The overall fix time is identified by an asterisk in the Lndg Code column when an aircraft has Code 3 discrepancies.

NSN - The national stock number (NSN) of the needed repair parts.

Noun	-	The nomenclature of the needed repair part.
WUC	-	The work unit code (WUC) associated with the major repair part or system.
Qty	-	Quantity of repair part(s) if needed.
In WRSK	-	For the user to identify if the repair part is available in the WRSK (Yes/No).
MESL	-	For the user to identify whether the affected system is on the minimum essential systems list (MESL) if the part is not on-hand (Yes/No).
Msg DTG	-	For the user to write the date-time-group of the message requesting a part not available in the WRSK.
Remarks	-	To provide a short, general description of the discrepancy associated with a maintenance event.

II. Aircraft Inspections

1. Phase Inspection. Aircraft maintenance and scheduling is based, in part, on flying time and phase hours. Maintenance is a cyclic process and a phase inspection starts the cycle. A phase inspection is accomplished every 200 flying hours. In the "real world" environment, an aircraft which has flown a 5-hour mission immediately following a phase is counted as having 195 hours remaining until the next phase. However, in the interest of "simplicity" for this exercise, we will accumulate flying/phase hours (i.e. 0 + 5 = 5, 5 + 5 = 10, etc).

a. When 200 hours have been accumulated on an aircraft, you remove the aircraft from the flying schedule (line-up) and perform a contingency phase inspection. Contingency phase inspections are much different from those accomplished during peacetime. The contingency phase is an abbreviated phase inspection to inspect critical items crucial to combat mission effectiveness. The amount of time required to perform each phase inspection is determined by using Table B-1. Because phase inspection teams improve their proficiency with each successive contingency phase inspection, each phase takes less time to perform than the last until 31 hours is reached.

(1) You also have a 10 percent (20 hour) leeway on when to accomplish the phase which helps streamline the scheduling process. In other words, depending on mission requirements, you can accomplish the phase inspection any time between the 180 and 220-hour point. However, you should attempt to accomplish the phase as close to the 200-hour point as possible.

(2) To further explain, an aircraft could be tasked to fly a 8-hour mission if it had 220.0 or less hours accumulated since last phase. However, it would not be good scheduling practice to do so. Furthermore, if an aircraft lands with 220.1 hours accumulated since last phase, it is "GROUNDED" until the phase has been completed.

b. To improve your readiness and aircraft availability, ensure you stagger the phase hours of your aircraft. The phase inspection schedule can have dramatic effects on your aircraft availability and readiness, both good and bad. No two aircraft should be allowed to come due or be undergoing phase inspection at the same time, if at all possible. Generally speaking, you will not have the maintenance capability to phase more than one aircraft at a time. Plan

which aircraft you will fly to keep your overall phase schedule balanced.

c. Upon completion of a phase inspection, you must "reset the clock." This means the aircraft now has 0.0 phase hours accumulated. Remember to update the CPX MX worksheet.

d. Other maintenance actions can and should be accomplished concurrently with the phase inspection. However, some fix times from the database may exceed the phase time. When this occurs, use the longer database fix time. In either case, a 4-hour preflight/thruflight must be added to whichever time is longer to account for refueling, servicing, ground crew and air crew preflight times.

e. If an aircraft flush (emergency evacuation) is imminent, an aircraft can be considered flyable if it has been undergoing phase inspection for less than 2 hours. Furthermore, an aircraft overdue phase inspection can be launched in an emergency, assuming it is in flyable condition.

PHASE INSPECTION IN A NUTSHELL

- Due every 200 +/- 20 (180 to 220) flying hours (since last phase).
- Use Table B-1 to determine the time required to perform the phase inspection.
- Use the longer of either the 31-hour phase time or the database fix time and then add the 4-hour preflight/thruflight.
- Reset the aircraft's phase hours to 0.0 hours (accumulated).
- Aircraft is flushable if less than 2 hours from the phase start time.

Figure B-1. Phase Inspection In a Nutshell

f. Determine the time required to perform a contingency phase inspection from Table B-1. The table reflects that the phase team becomes more efficient each time they perform the inspection. For example, the first aircraft which comes due for a phase inspection will take the phase inspection team 72 hours to complete. However, when the second aircraft comes due for a phase inspection, it will take the team only 59 hours to perform, and so on. The sixth phase inspection and all others will take the team 31 hours to perform.

TABLE B-1

CONTINGENCY PHASE INSPECTION TIMES

Phases performed by the phase team	Time Required to Perform
1st	72.0 hours
2nd	59.0 hours
3rd	48.0 hours
4th	39.0 hours
5th	33.0 hours
6th and all other phase inspections performed	31.0 hours

2. Hourly Post-flight (HPO) Inspection. The HPO is another inspection that affects flying hour and maintenance scheduling.

a. The HPO is accomplished every 50 hours. However, no HPO is required at the 200-hour point because it is accomplished as a part of the phase inspection. A 10 percent (5 hour) leeway is also provided for this inspection providing a 45 to 55 hour window (since last inspection) in which to accomplish the inspection. In other words, the inspection can be performed after the aircraft has accrued 45 flying hours, but the aircraft cannot be launched with more than 55 flying hours since last HPO or phase until the inspection has been completed. This inspection requires 2 hours to complete.

b. The database fix time and the 4-hour preflight/thruflight time is added to the 2-hour HPO.

HPO INSPECTION IN A NUTSHELL

- Due every 50 +/- 5 (45 to 55) flying hours (since last HPO).
- Takes 2 hours to complete.
- The database fix time and the 4-hour preflight/thruflight times are added to the 2-hour HPO.
- Reset HPO hours to 0.0 when:
  - An HPO inspection is completed.
  - A phase inspection is completed (HPO is integral part of phase).

Figure B-2. HPO Inspection In a Nutshell

III. Aircraft Parts

1. Many assumptions have been made in the area of aircraft parts. Our objective is to drive demands for the critical parts reflected in the database. So that the database is kept to a manageable size, many less critical parts are not shown. The deployed unit has an extensive amount of bench stock with them.

2. Part(s) requirements are identified in the database by national stock number (NSN), noun (nomenclature), work unit code (WUC) and the quantity required. A WRSK (CSMS asset master file) listing identifies authorizations by stock number and WUC, and indicates the quantity authorized and quantity on-hand.

3. When a part or parts are identified in the database for a maintenance event (Code 2 or 3), the current WRSK listing for the deploying unit should be checked.

a. If the part is available in the WRSK, simply write "yes" in the "In WRSK" column of the database and consider the aircraft repaired within the specified database fix time.

b. If the part is not available in the WRSK, the appropriate Logistics Readiness Center (LRC) should be notified of the exercise part requirement via message. The NSN, noun, WUC and quantity are shown in the database. Post the message Date-Time-Group (DTG) in the "Msg DTG" column.

(1) Non-Essential System. If the system is not listed in the Minimum Essential Systems List (MESL, AFR 65-110/SAC Sup 1), or the system is Code 2, or there is a high probability the aircraft could complete its mission without the replacement part, fly the aircraft "as is". Do not cannibalize if nothing would be gained by doing so. Your goal is to maximize aircraft availability. See paragraph 5 for more discussion of the MESL.

(2) Essential System. If the system is essential, then cannibalization is probably in order. Refer to paragraph 5 for help in determining whether a system is essential in the conventional or SIOP role. Remember to consolidate cannibalizations to as few aircraft as possible. If the option to cannibalize is selected, the aircraft receiving the part can be considered flyable at the end of its database fix time.

(3) Make sure cannibalization actions are shown on the CPX MX Worksheets and the database. This way you

will know exactly what has been cannibalized from an aircraft and can better track the MICAP condition. A MICAP condition exists when the non-availability of a part renders an aircraft or system out of commission for its intended purpose.

(4) Consider the "donor" aircraft flyable when notified by the LRC that the MICAP is satisfied and the database fix time has elapsed. If the LRC fails to notify you of the delivery date for a MICAP part, consider the delivery date of the part to be 7 days from date and time the aircraft was declared MICAP.

4. Update the quantities on the WRSK listing and keep them current. When parts are used out of the WRSK, reduce the on-hand quantity by the number taken (in pencil). Likewise, when items are received, show the appropriate quantity increases.

5. The MESL excerpt from AFR 65-110/SAC Sup 1, Attachment 1 is included in your response cell kit to help you determine whether or not an aircraft must have a particular system operational to fly an air refueling mission. This determination is necessary because there are many Code 3 discrepancies which may, in fact, be flyable.

a. When a question arises about whether an aircraft can be flown without replacing a part which is zero balance in the WRSK:

(1). Get the first two digits of the WUC of the part identified in the database. These two digits correspond with the digits in the "WUC" column in the MESL listing.

(2). Next, follow the row across the page to the "Conventional" column or "SIOP" column. An "X" in the appropriate column indicates that the system needs to be operational to fly the conventional or SIOP mission. When a number is listed in parentheses, go to the footnote with that number. The footnote will tell you what the system must be capable of in order to be considered flyable.

b. It is important that operations and logistics personnel discuss system requirements when there is any question about the flyability of an aircraft for discrepancies where a replacement part is not available. Many workarounds must be used in a time of conflict. Consider the feasibility of various alternatives to the problems. You may find, however, that cannibalization may be the only viable option.

IV. Initial Forms Set-up

1. All entries should be made in pencil so changes can be made quickly and easily.

2. Figure B-3 shows the preferred charting symbols and sample documentation for CPX MX Worksheets 1 and 2.

3. CPX MX Worksheets 1 and 2 are almost identical. CPX MX Worksheet 2 is simply an extension of CPX MX Worksheet 1 without the STARTEX (Start Exercise) data section.

4. CPX MX Worksheet 1 - STARTEX Data Section:

a. From the aircraft listing provided in your response cell bag, enter the aircraft tail numbers in the "Acft T.N." column and each aircraft's hours in the "Acft Hrs" column.

b. Determine and enter each aircraft's STARTEX phase and HPO hours from Table B-2 as follows:

(1) Go horizontally across the top of Table B-2 to the column which matches the number of primary aircraft assigned (PAA) for your location. Then proceed down the column transcribing the phase and HPO hours for each aircraft to the STARTEX data section of the CPX MX Worksheet 1. The numbers were selected at random from uniform distributions to establish a standardized starting basis for exercise play.

(2) Improve your overall readiness by performing phase inspections or HPOs, as appropriate, at STARTEX on aircraft which are above the lower hour limits for the inspections to be performed (if your taskings will allow).

5. CPX MX Worksheets 1 and 2 - Timeline Section:

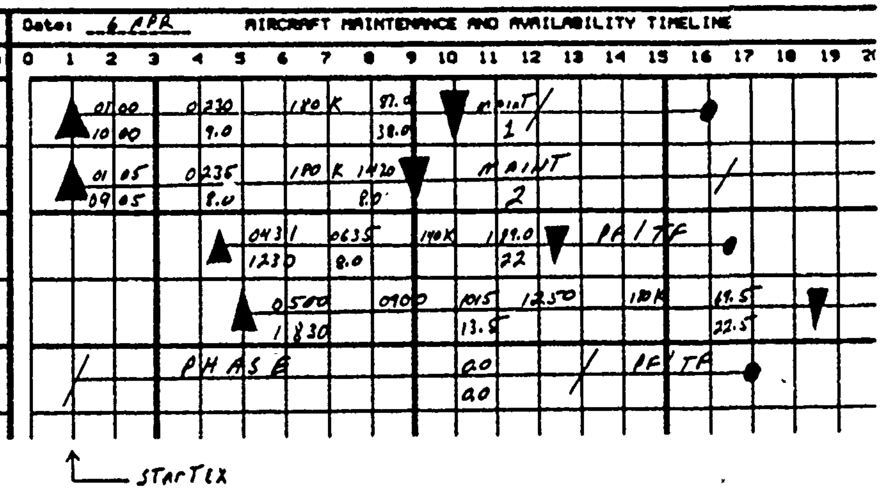
a. Post the date at the top of the worksheet.

b. Each number running across the top represents an hour on the 24 hour clock.

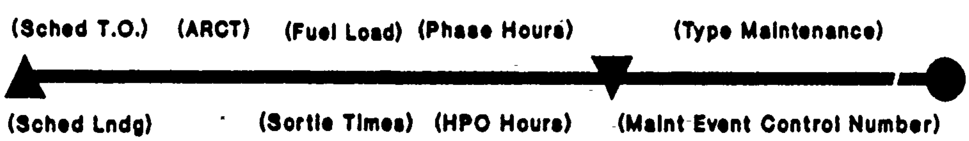
c. Document activity in this section using the symbols and example shown in Figure B-3. The best procedure is to tape these forms together to create a continuous horizontally-running scroll with the date at the top of each form.

-CPM MM WORKSHEET 1-

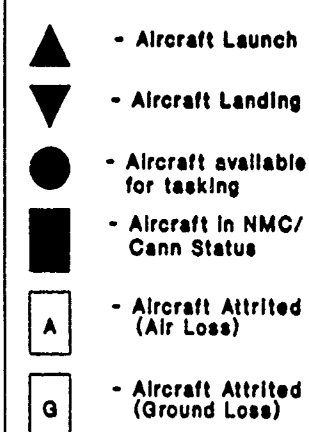
STARTEX Data			
Acft T.N.	Acft Hrs	Phase Hrs	HPO Hrs
61-1234	10,117	74	29
61-2345	10,543	139	0
61-3456	11,001	151	14
61-4567	10,780	56	9
61-5678	9,971	194	7



KEY TO TIMELINE DOCUMENTATION



KEY SYMBOLS



TIMELINE LENGEND

Sched T.O. - Scheduled Takeoff Time
Sched Lndg - Scheduled Landing Time
ARCT - Air Refueling Control Time
Fuel Load - Fuel Load Required for Mission
Sortie Time - Duration of Sortie in Hours
Phase Hrs - Phase Inspection Hrs Accum.
HPO Hrs - Hourly Postflight Hrs Accum.
Type Maint - Type of Maint. Being Performed
Maint Event Control Number - (From Database)
PF/TF - Preflight/Thruflight

Figure B-3. Timeline Documentation and Special Symbols

TABLE B-2

AIRCRAFT PHASE AND HPO TIMES AT STARTEX (Accumulated Hours)

Acft Line #	5 PAA		6 PAA		7 PAA		8 PAA		9 PAA		10 PAA		11 PAA		12 PAA		13 PAA		14 PAA		15 PAA	
	PH	HPO	PH	HPO	PH	HPO	PH	HPO	PH	HPO	PH	HPO	PH	HPO	PH	HPO	PH	HPO	PH	HPO	PH	HPO
1	81	10	12	2	166	15	167	25	129	22	105	30	156	7	180	4	64	14	125	28	14	8
2	29	22	76	29	39	46	194	1	73	6	47	24	189	6	48	19	196	6	89	26	102	30
3	5	24	89	32	42	48	48	33	144	11	150	14	61	27	23	16	191	30	78	4	166	1
4	179	42	156	48	47	39	188	27	101	48	53	8	99	18	187	13	133	25	127	13	55	49
5	145	37	164	9	185	6	69	32	189	33	183	3	113	17	99	33	196	38	65	44	54	3
6			186	28	75	14	41	21	40	46	170	33	125	49	56	18	110	0	33	29	110	23
7					104	36	143	12	23	22	45	10	168	48	147	20	126	27	35	17	62	35
8							174	40	16	28	130	7	147	31	126	31	92	15	180	5	127	46
9									148	2	25	42	86	23	20	16	41	39	23	18	143	50
10											173	16	197	42	154	19	142	18	197	24	69	36
11													59	9	143	13	41	38	104	14	150	34
12															172	47	147	18	94	45	24	32
13																	48	36	103	18	70	15
14																			71	47	10	48
15																					23	12

V. At STARTEX

1. During the exercise, please make comments directly on the database, worksheets and information guides where the comments apply. As you find problems or have suggestions for improving these documents, please write them down. This is probably the best and easiest way for us to know how to make genuine improvements to the system.

2. Upon initiation of flying activity (STARTEX), the following procedures will be used:

a. Plotting Sorties. When mission taskings are received and mission planning is complete, plot the sorties on the CPX MX Worksheets 1 and/or 2 using the symbols and charting technique shown in Figure B-3. The tanker planner will provide you with the scheduled takeoff and landing times, air refueling control time (ARCT), and sortie duration. You will be concerned with four types of times when plotting the aircraft timelines: 1) sortie time, 2) phase and/or HPO times when applicable, 3) fix time, and lastly 4) preflight/thruflight times. The 4-hour preflight/thruflight is used to account not only preflight/thruflights/postflights, but also refueling, and servicing.

(1) Determine which aircraft you will fly. Then, on the CPX MX Worksheet 1, draw an up-triangle (takeoff) at the takeoff time and a down-triangle (landing) at the landing time of each aircraft you select to fly. Connect the triangles with a straight-line (timeline). Above and below the timeline post the scheduled takeoff and landing times, ARCT, and sortie duration as shown in Figure B-3.

(2) Determine each aircraft's accumulated phase and HPO hours by adding the sortie duration to the previous hours accumulated and enter the totals on the timeline as shown in Figure B-3.

b. Plotting Maintenance Events. Starting with the first aircraft to land:

(1) On the CPX MX Worksheet 1 or 2, if any inspections (HPO or Phase) are due, extend the timeline from the landing symbol (down-triangle) for the proper number of hours and end the line with a slash. Identify the type of inspection above the line and reset the appropriate hours to 0.0. Show phase hours above the line and HPO hours below the line.

(2) Next, go to the first unassigned maintenance event in the database. A maintenance event is defined as all the lines of the database associated with a specific "maintenance event control number". The maintenance event is unassigned until an aircraft T.N. is posted in the "Acft T.N." column in the database.

(3) Post the tail number of the landing aircraft in the Acft T.N. column on the database.

(4) From the database, we select the longest "Fix Time" associated with a Code 3 discrepancy. This is easily identified by an asterisk in the "Lndg Code" column. The hours in the fix time column following the asterisk will be the maintenance fix time for the whole aircraft. Extend the timeline for the fix time hours and post the "maintenance event control number" below the timeline as shown in Figure B-3. If there are no Code 3 discrepancy's listed, then no fix time hours are plotted. This is because the aircraft is "mission capable" even with Code 2 discrepancies. However, the maintenance event is still assigned to that aircraft and parts are consumed.

(5) Finally, extend the timeline to show the 4-hour preflight/thruflight time and label it "PF/TF". At the end of the timeline accounting for PF/TF, place a circle symbol (aircraft available for tasking) as shown in Figure B-3.

(6) Repeat the above steps each time a mission tasking is received. When plotting timelines and you come to 2400 hours on one CPX MX worksheet, continue the plotting at 0000 hours on the succeeding CPX MX worksheet. You will find after a little practice these procedures go very quickly and smoothly.

(7) Once the plotting is complete, it is easy to provide the response cell team chief with projected aircraft availability for each tasking period. If there are no entries on the timeline to the right of a circle, the aircraft is available for tasking beginning with the period following the one in which the circle is located.

c. Next, the availability of any needed parts shown in the database are checked using the current home unit WRSK listing. Procedures in the preceding "Aircraft Parts" section should be followed. Ensure the appropriate LRC is notified via message of parts shortages. Post the message date-time-group (DTG) to the database in the column titled

"Msg DTG" and monitor status. If an aircraft is not mission capable (NMC) because it is in "Cann" status, draw the box symbol shown in Figure B-3 on the timeline at the time the aircraft goes into NMC/Cann status.

d. From time to time you will receive Master Scenario of Events Listing (MSEL) inputs. Some of the inputs will affect your aircraft operations. When inputs are based on time, use the longer of either the MSEL input or the database fix time, when applicable. If a conflict arises about which procedures to follow, the MSEL inputs and tasking agency communications take precedence over the aircraft maintenance database. Don't confuse MSEL with MESL. The MESL is the Minimum Essential Systems List covered in Section III.

e. Database used up? If all maintenance events are used in the course of the exercise, simply start over again starting at maintenance event control number 1.

WORKSHEET PLOTTING IN A NUTSHELL

- Refer to Figure B-3 for sample.

- Plot launch and landing symbols at the scheduled takeoff and landing times. Connect with a straight-line (timeline).

- Post scheduled takeoff and landing times, ARCT, and duration above and below the timeline.

- Post new phase and HPO times by adding sortie duration to previous times.

- Extend timeline for inspections, if due.

- Post the aircraft T.N. to the database for the first unassigned maintenance event in the database.

- On the CPX MX Worksheet, extend the timeline plot for the fix time hours to the right of the asterisk (in the Lndg Code column) for that maintenance event.

- Post the maintenance event control number below the timeline as shown in Figure B-3.

- Extend timeline plot for the 4-hour preflight/thruflight. Post a circle at the end of the timeline.

- Check availability of needed parts in WRSK and reflect the consumption.

- Repeat above steps for each aircraft.

Figure B-4. Worksheet Plotting In a Nutshell

VI. During the Exercise

1. Special Database Events. To enhance exercise realism, late takeoffs, and air aborts are incorporated into the structure of the database.

a. Late Takeoffs. Late takeoffs are identified in the remarks column in the Database. The amount of time the aircraft is delayed for takeoff is also identified. From this information, operations personnel will be able to determine if the aircraft can satisfactorily make its timing. If it cannot, the mission is cancelled, unless earlier provisions were made for a backup spare aircraft.

b. Air Aborts. Air aborts are also identified in the remarks column in the Database. The T/O + time of the abort is also identified. From this information, operations personnel can determine if the mission was effective. To determine the landing time of the aircraft, simply multiply the T/O + time of the abort by 2 and add that time to the original takeoff time. All other lines in the maintenance event apply upon landing.

2. Attrition. If you are informed that an aircraft has been lost, mark the time and date the aircraft was lost on the CPX MX Worksheet. Place the appropriate attrition symbol at that point on the timeline and then line out the remainder of the row for that aircraft.

3. Additional/Replacement/Transit Aircraft. If additional, replacement, or transit aircraft are received by your unit, handle them as follows.

a. Add the tail number of the additional and/or replacement aircraft on the next open line on the CPX MX Worksheet 1 in the "Acft T.N." column.

b. Determine the phase and HPO hours for each of the new aircraft by referring to Table B-2. Simply, start over at the top of the appropriate column and transcribe the hours to the CPX MX Worksheet.

c. Determine the landing condition from the next unassigned maintenance event and plot the timeline for each aircraft using the procedures in the preceding "AT STARTEX" section.

4. Flow of Events. As the exercise play progresses, keep the following in the back of your mind. When flying actual combat missions and logistically supporting those opera-

tions, few things ever go as planned. You can be sure you need to expect the unexpected. Think and talk together about the factors that influence a deployed unit's operations which go beyond the scope of this database. For example, "How much time does it take to change fuel loads? What would you do if there was not enough time? What code three discrepancies are actually flyable? Can a lost capability on one aircraft be compensated by another aircraft if flying in cell?" and so on. These are worthwhile considerations to think about in the course of the exercise.

5. Playing Multiple Locations. If you are responsible for more than one location during the exercise:

a. Keep a separate set of CPX MX Worksheets for each location.

b. Use a separate database for each location.

c. Do not intermix events between locations.

VII. At ENDEX

No aircraft maintenance database can be totally free of problems and certainly this one is no exception. Therefore, we would like your inputs on how the database worked and how you think it can be improved. Please take the time to complete the Database Evaluations. Areas for your comments may include the content and format of the Database, the CPX MX Worksheets, the procedures for using the database in the Information Guide and any suggestions you may have to improve exercise play from the logistics perspective. The ...s are included in this package.

...ur participation and cooperation.

Appendix C: Practice Database

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0
For Use During Training Sessions Only

Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		1 (KC-135A/E/R)					
	2	4.0	1680006566170FL	BOOM NOZZLE	46771	1				P/F BOOM SIGNAL COIL CHECKS OPEN
	2	12.0	6610001553519	PITOT TUBE	51156	1				T/O+4:00 PILOT'S AIRSPEED INDICATOR U
$			MAINTENANCE EVENT CONTROL NUMBER:		2 (KC-135A/E/R)					
	3	12.0	1650009285725	FWD A/R PUMP LN	45199	1				P/F HYD FLUID FOUND IN FORWARD BODY F
SS			MAINTENANCE EVENT CONTROL NUMBER:		3 (KC-135A/E/R)					
	2	6.5	6610004631865	ALTIMETER	51132	1				T/O+1:00 PILOT'S ALTIMETER W/N RESET
SS			MAINTENANCE EVENT CONTROL NUMBER:		4 (KC-135A/E/R)					
	2	3.0			6411S	0				P/F PILOT'S INTERPHONE YOKE AND NUSEH
	2	2.0			46850	0				T/O+0:10 SIGNAL COIL TEST METER INOPE
	2	5.4			5241F	0				T/O+1:00 N1 COMPASS 3 DEGREES IN ERRO
	2	1.2			23HAK	0				T/O+4:55 #3 ENG RPM BELOW IDLE WITH T
					51310	0				
SS			MAINTENANCE EVENT CONTROL NUMBER:		5 (KC-135A/E/R)					
	2	4.5	5831005584250	CONTROL BOX	64110	1				T/O+0:15 PILOT'S INTERPHONE CUTS OUT
	2	4.0	6240002839598	LIGHT	44266	1				T/O+4:00 RIGHT MAIN LANDING GEAR LIGH
	2	2.0	6240002287130	LIGHT	44225	1				T/O+2:00 PDI CENTER HOLD LIGHT OUT ON
SS			MAINTENANCE EVENT CONTROL NUMBER:		6 (KC-135A/E/R)					
	2	2.5	6610012278781	FUEL MGMT CMPTR	51ECO	1				T/O+0:30 FSA DISPLAYED FUEL MGMT SYST
			6610011464953	FSAS CMPTR	51EAO	1				
	2	2.0	5826001345974	SLEW COUPLER	51AJO	1				T/O+2:30 BOTH HSI HEADING SET MARKERS
SS			MAINTENANCE EVENT CONTROL NUMBER:		7 (KC-135A/E/R)					

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0
For Use During Training Sessions Only

Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	2.0	6615005350179	COUPLER	52113	1				T/O+0:45 AILERON AXIS OF AUTOPILOT W/
SS			MAINTENANCE EVENT CONTROL NUMBER:		8 (KC-135A/E/R)					
	2	2.0			46750	0				T/O+1:00 WHEN BOOM WAS IN TRAIL BOOM
SS			MAINTENANCE EVENT CONTROL NUMBER:		9 (KC-135A/E/R)					
*	3	3.0	3010007395580HS	FLEX SHAFT	42196	1				#3 ENG CSD SHAFT SHEARED
	2	1.0	3010007395580HS	FLEX SHAFT	42196	1				T/O+4:30 #3 GENERATOR QUIT
SS			MAINTENANCE EVENT CONTROL NUMBER:		10 (KC-135A/E/R)					
	2	2.0			46822	0				P/F BOOM SIGHTING DOOR HOSE FITTING L
	2	2.0			5241F	0				P/F N1 COMPASS DIRECTIONAL GYRO HEADI
SS			MAINTENANCE EVENT CONTROL NUMBER:		11 (KC-135A/E/R)					
*	3	0.5			4215M	0				#1 GENERATOR HAS NO LOAD
	2	3.5	6615005892592	AMPLIFIER	52111	1				P/F AUTOPILOT AILERON AXIS ENGAGES BU
	2	2.5	6615005561979	CONTROLLER	52134	1				T/O+0:30 ALTITUDE HOLD DOES NOT MAINT
	2	2.3	5939008671415	RCVR/XMITTER	71ZH0	1				T/O+1:30 TACAN INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER:		12 (KC-135A/E/R)					
	2	3.0			46856	0				T/O+2:00 WHEN BOOMER TRIGGERED DISCON TO DISCONNECT THEN TO READY
SS			MAINTENANCE EVENT CONTROL NUMBER:		13 (KC-135A/E/R)					
*	3	46.0			49421	0				T/O+0:40 #2 ENG FIRELIGHT ILLUMINATED
	2	3.[illegible]	5826001345977	ADI	51AAB	1				T/O+0:10 PILOT'S RGA GAVE EXCESSIVE C
SS			MAINTENANCE EVENT CONTROL NUMBER:		14 (KC-135A/E/R)					

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0
For Use During Training Sessions Only

Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	3.0			46850	0				T/O+0:50 BOOM FIRES THROUGH TO A DISC
SS			MAINTENANCE EVENT CONTROL NUMBER:		15	(KC-135A/E/R)				
	2	8.5			23EE0	0				T/O+0:10 #3 THROTTLE SETTING 1 1/2 KN
	2	3.0			46840	0				T/O+2:00 BOOM HOIST MOTOR ALLOWS BOOM
SS			MAINTENANCE EVENT CONTROL NUMBER:		16	(KC-135A/E/R)				
	2	1.0			64112	0				T/O+3:00 COPILOT'S INTERPHONE SWITCH
SS			MAINTENANCE EVENT CONTROL NUMBER:		17	(KC-135A/E/R)				
	2	0.3			44225	0				T/O+1:30 PDI LIGHTS FOR TELESCOPING H
	2	1.0			1114J	0				T/O+0:30 COPILOT'S #2 WINDOW MAKES WH
SS			MAINTENANCE EVENT CONTROL NUMBER:		18	(KC-135A/E/R)				
	2	0.5			11443	0				T/O+1:00 HEAVY ICE BUILD-UP ON SIGHTI
SS			MAINTENANCE EVENT CONTROL NUMBER:		19	(KC-135A/E/R)				
	2	1.5	6610002365143CX	INDICATOR	51B00	1				T/O+0:05 COPILOT'S ANGLE OF ATTACK IN
	2	4.5	5841007946401	CONTROL	72MAC	1				T/O+0:30 ASQ-15 SYSTEM W/N HOLD PRESS
	2	10.2	6110004939247	VOLTAGE REG	4215M	1				T/O+0:10 ELECTRICAL POWER SURGED IN A
			6115001366617UH	GENERATOR	4215L	1				
	2	2.0	1630006294222	CONTL SHIELD	13E8A	1				T/O+1:55 PILOT'S RIGHT BRAKE PEDAL MA
SS			MAINTENANCE EVENT CONTROL NUMBER:		20	(KC-135A/E/R)				
	2	0.5			11139	0				T/O+4:40 STUD ON CREW ENTRY HATCH BRO
	2	1.0			63X00	0				P/F PILOT'S RADIO RECEPTION HAS LOUD

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0
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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		21	(KC-135A/E/R)				
	2	1.2			51BE0	0				T/O+0:20 PILOT'S ANGLE OF ATTACK INDI
	2	3.0	1650008714772	CHSNT SPD DRIVE	42A37	1				T/O+0:25 #1 GENERATOR INOPERATIVE
SS			MAINTENANCE EVENT CONTROL NUMBER:		22	(KC-135A/E/R)				
	2	2.0	6605010182181	INU	72YB0	1				T/O+6:30 INS 20 NM OFF COURSE AFTER 6
SS			MAINTENANCE EVENT CONTROL NUMBER:		23	(KC-135A/E/R)				
	2	2.0	6615005506628	MD1 GYRO	51142	1				T/O+0:30 PILOT'S ATTITUDE INDICATOR 0
	2	4.0	6615005892592	AMPLIFIER	52111	1				T/O+0:30 AUTOPILOT ALTITUDE HOLD WAND
			5306008592927	ELEV SERVO MOTOR	52123	1				
SS			MAINTENANCE EVENT CONTROL NUMBER:		24	(KC-135A/E/R)				
	2	26.0	6615005263441	ELEV FOLLOWUP	52137	1				T/O+0:30 AUTOPILOT ELEVATOR AXIS OSCI
			6615005892592	AMPLIFIER	52111	1				
			5306008852927	ELEV SERVO MOTOR	52123	1				
			6615007787467	STAB TRIM ACT.	52124	1				
SS			MAINTENANCE EVENT CONTROL NUMBER:		25	(KC-135A/E/R)				
	2	1.5			51BE0	0				T/O+0:20 COPILOT'S ANGLE OF ATTACK GA
	2	3.0	2995007797311RU	BLD VLV GOVERNOR	23LAC	1				T/O+0:45 #1 ENG W/N REACH MRT AT TEMP
	2	2.0	2995007797311RU	BLD VLV GOVERNOR	23LHC	1				T/O+0:45 #2 ENGINE W/N ACHIEVE MRT AT
	2	1.0			23N00	0				T/O+0:20 #4 THROTTLE TOO FAR AFT OF 0
	2	2.0	5841010781341	RCVR/XMITTER	72180	1				T/O+0:50 APN-218 DOPPLER WENT INTO ME
	2	0.5	6240002787230	LIGHT	44225	5				T/O+1:00 PDI ELEVATION LIGHTS REPORTE
	2	0.5			1114A	0				T/O+1:00 BUBBLES IN BOOM SIGHTING WIN
SS			MAINTENANCE EVENT CONTROL NUMBER:		26	(KC-135A/E/R)				
	2	2.2	6615007787467	STAB TRIM ACT.	52124	1				T/O+4:45 STAB TRIM STOPPED WORKING IN

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0
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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		27	(KC-136A/E/R)				
	2	4.0	1680006566170FL	BOOM NOZZLE	46771	1				T/O+1:00 AFTER CONTACT WITH RECEIVER
SS			MAINTENANCE EVENT CONTROL NUMBER:		28	(KC-135A/E/R)				
	2	4.2	6610012278781	COMPUTER	51EC0	1				T/O+0:01 DURING CLIMBOUT FSA/CAS ICDU
	2	17.9	1650008564613	CSD	42194	1				T/O+0:45 SEVERE KWS LOAD SWAPPING NOT
	2	2.0			72200	0				T/O+1:00 RADAR WEAK AND TARGET FUZZY
	2	3.0			13000	0				T/O+5:00 WARNING HORN SOUNDED WITH TH
	2	6.2			13AA0	0				AIRCRAFT REQUIRES JACKING TO TROUBLE
SS			MAINTENANCE EVENT CONTROL NUMBER:		29	(KC-135A/E/R)				
	2	6.0	5930010853351	AIR FLOW SENSOR	72YK0	1				T/O+0:35 INS LOW AIR LIGHT ON
	2	0.5			51515	0				T/O+1:00 #3 FUEL GAUGE SHOWS ERRATIC
	2	1.0	6610000848695	RDU	516E0	1				T/O+0:10 FSA/CAS RDU W/N DISPLAY CLIM
	2	1.0			51E00	0				T/O+1:30 FSA/CAS DATA PG 2 TRUE AIR S
	2	2.0			46755	0				T/O+1:30 BOOM TRAILED AT 33-34 DEGREE
	2	1.0			51516	0				CENTER WING & #4 MAIN TANKS READING I
SS			MAINTENANCE EVENT CONTROL NUMBER:		30	(KC-135A/E/R)				
	2	0.2			51131	0				FSA TRUE AIRSPEED INDICATOR REQUIRES
SS			MAINTENANCE EVENT CONTROL NUMBER:		31	(KC-135A/E/R)				
	2	33.5			51500	0				T/O+2:00 #4 MAIN TANK BURNS FASTER TH
					46000	0				
	2	7.0	6115001366617UH	GENERATOR	4215L	1				T/O+0:00 #3 GENERATOR W/N TAKE LOAD F
			1650008564613	CSD	42194	1				
	2	2.0			46810	0				T/O+1:00 BOOM ACCUMULATOR DID NOT HOL
	2	1.0			51AA0	0				T/O+0:00 PILOT'S RGA ROTATION COMM 40

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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
	2	1.0	5826001345977	ADI	51AAB	1				T/O+3:00 COPILOT'S NAV LOC/APP AUTO H
SS			MAINTENANCE EVENT CONTROL NUMBER:		32	(KC-135A/E/R)				
	2	2.0	6130007728567NT	PWR SUPPLY	5J31C	1				T/O+0:05 FUEL FLOW READINGS LOW FOR A
	2	4.0			632AA	0				T/O+0:30 #2 COMM RADIO SQUELCH SWITCH
	2	6.0	5841008454243	GYRO	722W0	1				T/O+2:00 APN-59 NAV RADAR STAB SWITCH
SS			MAINTENANCE EVENT CONTROL NUMBER:		33	(KC-135A/E/R)				
	2	1.5	6620004459417	TRANSDUCER	23MAG	1				T/O+2:00 #3 EPR GAUGE SLOWLY BEGAN RO
SS			MAINTENANCE EVENT CONTROL NUMBER:		34	(KC-135A/E/R)				
	2	3.0	2995006975995	SWITCH	23J99	1				T/O+2:00 #3 ENGINE LOW OIL PRESSURE L
	2	1.0			469AA	0				T/O+3:30 FIVE SECOND DELAY OCCURED DU
	2	1.0			46768	0				T/O+2:00 BOOM TRAILS AT 3 DEGREES RIG
	2	0.5			63X00	0				T/O+2:00 #1 COMM RADIO SQUELCH CUTS O
	2	1.0	5826001345981	HSI	51AAD	1				T/O+1:00 COURSE SELECTOR ON PILOT'S H
	2	1.0	5999011341357	SWITCH	64115	1				T/O+1:00 HOT MIKE AT BOOM STATION IN
	2	4.0			51AHD	0				T/O+3:00 N1 & J4 READ 5 DEGREES IN ER
	2	1.0	6615005350145	MOTOR	52121	1				T/O+2:00 AILERON AXIS OF AUTOPILOT IN
SS			MAINTENANCE EVENT CONTROL NUMBER:		35	(KC-135A/E/R)				
	2	2.0			46755	0				T/O+0:30 BOOM TRAILS AT 33 DEGREE ELE
	2	1.5			46771	0				T/O+0:30 BOOM NOZZLE HAS EXCESSIVE FU
	2	3.0			46841	0				T/O+1:00 BOOM W/N FLY UP TO STOW POSI
	2	4.0			46851	0				T/O+0:40 A/R CONTROL CIRCUIT BREAKER
SS			MAINTENANCE EVENT CONTROL NUMBER:		36	(KC-135A/E/R)				
	2	6.8	5330007024715	TRANSMITTER	23MAF	1				T/O+1:00 #4 ENG OIL PRESSURE GAUGE FL

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0
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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER: 37 (KC-135A/E/R)							
	2	15.0	5841001339183	RCVR/XMITTER	722C0	1				T/O+0:10 APN-59 RADAR PICTURE IS BLUR
SS			MAINTENANCE EVENT CONTROL NUMBER: 38 (KC-135A/E/R)							
	2	3.0			72000	0				T/O+3:00 NAVIGATOR'S RADAR INOPERATIV
					72200	0				
	2	2.5			72000	0				T/O+3:00 RADAR TILT READS 10-15 LOW F
					722A0	0				
SS			MAINTENANCE EVENT CONTROL NUMBER: 39 (KC-135A/E/R)							
	2	2.0			52410	0				T/O+1:00 N1 & J4 COMPASSES ARE OFF BY
SS			MAINTENANCE EVENT CONTROL NUMBER: 40 (KC-135A/E/R)							
	2	3.0	6615005094801	AXIS RATE SENSOR	52143	1				T/O+0:45 RUDDER AXIS OF AUTOPILOT DEF
	2	9.8	6130007728567NT	PWR SUPPLY	5131C	1				T/O+2:30 BOOM OFFLOAD TOTALIZER INOPE
			6620006212902	BOOM O/L XMITTER	51911	1				
	2	2.5	6615005094801	AMPLIFIER	52143	1				T/O+0:55 AUTOPILOT ELEVATOR AXIS CAUS
	2	22.0	4320009334697HS	HYD PUMP	4511E	2				T/O+4:00 RIGHT HYD SYSTEM PRESSURE RE
			1560000987239FL	RT HYD SYS ACCUM		1				
			1560000987239FL	BOOM ACCUM		1				
			1560000987239FL	RUDDER ACCUM		1				
			4330002773274	AIR FILTER	45142	1				
			4820007172679HS	AIR PRESS REGLTR	45141	1				
	2	2.0			41126	0				T/O+2:30 CABIN PRESS MAINTAINED 1000
	2	2.0			64199	0				T/O+2:00 BROKEN WIRE AT PILOT'S NOSEW
SS			MAINTENANCE EVENT CONTROL NUMBER: 41 (KC-135A/E/R)							
	2	2.5			23NA0	0				T/O+0:10 THROTTLES 1 & 4 ARE 2-3 KNOB

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0
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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		42	(KC-135A/E/R)				
	2	12.0			23R00	0				MAIN WATER TANK HAS LEAK
SS			MAINTENANCE EVENT CONTROL NUMBER:		43	(KC-135A/E/R)				
	2	3.0	5826001345973	AMPLIFIER	51AB0	1				T/O+5:00 COPILOT'S ATTITUDE WARNING A
SS			MAINTENANCE EVENT CONTROL NUMBER:		44	(KC-135A/E/R)				
	2	5.5			23NA0	0				T/O+4:00 #1 ENG LAGS BEHIND ALL OTHER
SS			MAINTENANCE EVENT CONTROL NUMBER:		45	(KC-135A/E/R)				
	2	2.5	6615005506628	MD1 GYRO	51142	1				T/O+0:30 COPILOT'S ALTITUDE INDICATOR
SS			MAINTENANCE EVENT CONTROL NUMBER:		46	(KC-135A/E/R)				
	2	1.8	5826010124864	CONVERTER	712B0	1				T/O+0:01 TACAN SELF TEST FAILED
	2	4.0			46775	0				T/O+1:00 BOOM HAS LOUD BANGING NOISE
	2	8.0	6615005269441	SYNCHRO	52135	1				T/O+0:45 AUTOPILOT AILERON AXIS WON'T
SS			MAINTENANCE EVENT CONTROL NUMBER:		47	(KC-135A/E/R)				
	2	2.8			44225	0				T/O+1:30 RECEIVER LIGHTS W/N GIVE "UP
SS			MAINTENANCE EVENT CONTROL NUMBER:		48	(KC-135A/E/R)				
	2	12.0	5306008892927	SERVO MOTOR	52123	1				T/O+0:05 (REPEAT) RUDDER PEDALS FLUTT
	2	3.2			63XA0	0				T/O+0:05 #1 COMM RADIO HAS STATIC CLI
	2	2.8	6610012173578	BSIU	51EE0	1				T/O+0:30 DNS DRIFT READS 10 DEGREES R
	2	10.0	6615005550155	ELEV SERVO MOTOR	52123	1				T/O+4:15 ELEVATOR AXIS INOPERATIVE

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0
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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER: 49 (KC-135A/E/R)							
	2	1.0			721B0	0				P/F DOPPLER W/N INITIATE DURING PREFL
SS			MAINTENANCE EVENT CONTROL NUMBER: 50 (KC-135A/E/R)							
	2	2.0	5821011948161	RCVR/XMITTER	632AA	1				T/O+1:00 #2 COMM RADIO WAS INTERMITTE
SS			MAINTENANCE EVENT CONTROL NUMBER: 51 (KC-135A/E/R)							
	2	0.8	6620000784470	TRANSDUCER	23M0D	1				T/O+1:30 #1 ENG EPR GAUGE ROTATED APP
SS			MAINTENANCE EVENT CONTROL NUMBER: 52 (KC-135A/E/R)							
	2	7.5	5306001511414	SERVO MOTOR	52124	1				T/O+2:20 AUTOPILOT ELEVATOR AXIS WENT
SS			MAINTENANCE EVENT CONTROL NUMBER: 53 (KC-135A/E/R)							
	2	0.5			12CBA	0				T/O+0:45 NAV APN-69 INOPERATIVE
	2	0.5	6615005892592	RECTIFIER	52111	2				T/O+0:30 ELEVATOR AXIS DOES NOT RESPO
SS			MAINTENANCE EVENT CONTROL NUMBER: 54 (KC-135A/E/R)							
	2	22.9			6411D	0				T/O+0:15 INCOMING TRANSMISSIONS AND I
SS			MAINTENANCE EVENT CONTROL NUMBER: 55 (KC-135A/E/R)							
	2	0.5			5131C	0				T/O+4:00 ALL FOUR FUEL FLOW XMITTERS
SS			MAINTENANCE EVENT CONTROL NUMBER: 56 (KC-135A/E/R)							
	2	7.0			63WC0	0				#1 UHF W/N TRANSMIT
SS			MAINTENANCE EVENT CONTROL NUMBER: 57 (KC-135A/E/R)							
	2	2.5			722L0	0				RADAR TILT KNOB LOOSE ON CONTROL BOX

KC-135 A/E/R AIRCRAFT MAINTENANCE LOGISTICS DATABASE Version 1.0
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Acft T.N.	Lndg Code	Fix Time	NSN	NOUN	WUC	Qty	In WRSK	MESL	Msg DTG	REMARKS
SS			MAINTENANCE EVENT CONTROL NUMBER:		58 (KC-135A/E/R)					
	2	0.1			72VB0	0				T/O+1:30 PILOT'S RADIO ALTIMETER LIGH
SS			MAINTENANCE EVENT CONTROL NUMBER:		59 (KC-135A/E/R)					
	2	1.5			5241F	0				T/O+0:20 N1 COMPASS 4 DEGREES IN ERRO

Appendix D: CPX MX Worksheets 1 and 2

SECRET <WHEN FILLED IN>

-CPX MX WORKSHEET 1-

STARTEX Date

AIRCRAFT MAINTENANCE AND AVAILABILITY TIMELINE

Date: ____________

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Acft T.N.	Acft Hrs	Phase Hrs	HPO Hrs

SECRET <WHEN FILLED IN>

Figure D-1. CPX MX Worksheet 1 (Actual Size: 15" x 11")

-CPX MX WORKSHEET 2-

SECRET (WHEN FILLED IN)

Date: ----------------

AIRCRAFT MAINTENANCE AND AVAILABILITY TIMELINE

Acft T.N.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

SECRET (WHEN FILLED IN)

Figure D-2. CPX MX Worksheet 2 (Actual Size: 15" x 11")

Appendix E: Evaluation Surveys

KC-135A/E/R AIRCRAFT MAINTENANCE
LOGISTICS DATABASE

EVALUATION SURVEY 1

1. The KC-135A/E/R Aircraft Maintenance Logistics Database and its associated worksheets and instructions were developed to make response cell exercise play more realistic, place aircraft availability at more realistic levels, generate realistic part demands and streamline logistics play. Therefore, it is very important to have your comments and criticism on the new system and to know, in your opinion, if it is reaching the goals as stated above. To do this effectively, we would like each of you who used the database, or who would simply like to comment, to do two things.

2. First, during the mock exercise, please make comments directly on the database, worksheets and the information guides where comments apply. As you find problems or things which could be improved write them down. This is probably the best and easiest way to know how to make genuine improvements to the new system.

3. Second, we would like your comments to the statements and questions on the next two pages. (One evaluation from each person.) Please remember, it is your comments and opinions we are interested in, not what you think we would like to hear. We will refer to the Aircraft Maintenance Logistics Database as the "database".

4. You do not need to place your name anywhere on this database evaluation.

5. Using the scale shown at the top of the next two pages, please place the number which corresponds to your opinion about each statement on the line preceding each statement. Please comment as to why you feel as you do in the space provided. Your comments will be used to evaluate the effectiveness of the database and make whatever improvements may be needed. Then, on the last page, respond to the last two categorical questions.

Strongly agree	Tend to agree	Can't agree or disagree	Tend to disagree	Strongly disagree
1	2	3	4	5

1. _____ The database helped make exercise play in the response cell more realistic.

   Why or how?

2. _____ The database makes it easy to get the information I need to plot aircraft maintenance actions, inspections, and turn times.

   Why or how?

3. _____ The database makes it easy to get the information I need to determine the availability of each aircraft.

   Why or how?

4. _____ The database makes it easy for me to determine what repair parts I need when an aircraft lands.

   Why or how?

5. _____ Having the discrepancy associated with a given part requirement helped make the demands more realistic.

   Why or how?

6. _____ Having the noun and work unit code associated with the national stock number for a needed part helped me locate the part in the WRSK listing and more easily identify the item in message traffic.

   Why or how?

Strongly agree	Tend to agree	Can't agree or disagree	Tend to disagree	Strongly disagree
1	2	3	4	5

7. _____ Having the noun and work unit code associated with the national stock number for a needed part helped me determine whether a part was essential to fly a given mission and track cannibalizations.

   Why or how?

8. _____ The CPX MX Worksheets along with the new symbols and charting technique streamlined the tracking of each aircraft's flying and maintenance requirements.

   Why or how?

9. _____ Working with the practice data base and other training materials adequately prepared me for using the database during the exercise.

   Why or how?

10. _____ The information guide helped me understand my job in the response cell and answered the questions I had.

    Why or how?

    a. What information was <u>not</u> provided that would have been helpful?

    b. What information was provided that was <u>not</u> useful or helpful?

Please answer the following questions by circling the letter that best applies to the appropriate response.

11. ____ Have you, at any time in your military career, ever participated as a response cell member in a Command Post Exercise (a military exercise in which the existence and movement of combat forces are simulated)?

A. Yes.

B. No.

C. Not Sure.

(Please respond to Question 12 if you answered "YES" to Question number 11)

12. ____ If your response to question 11 was "YES," what type of model do you think was used during the Command Post Exercise to simulate aircraft maintenance and other logistic functions?

A. A historical aircraft maintenance database model SIMILAR to the one used during the mock exercise.

B. Some other type of model (or data) NOT SIMILAR to the historical aircraft maintenance database model used during the mock exercise.

C. Not sure whether the model used was a type of historical aircraft maintenance database model or some other type of model.

PLEASE USE THE REVERSE SIDE
FOR YOUR ADDITIONAL COMMENTS AND OBSERVATIONS

EVALUATION SURVEY 2

COMPARISON BETWEEN LOGISTIC MODELS USED DURING CPX

1. This evaluation shall be completed only by those individuals who have participated in a Command Post Exercise (CPX) as a response cell member sometime during their military career.

2. The response to each question should be based on a comparison between the KC-135A/E/R Aircraft Maintenance Database Model used during the mock exercise, and aircraft maintenance data used during your previous experience(s) as a response cell member during a Command Post Exercise (CPX).

> IMPORTANT NOTE: Throughout the evaluation survey, the KC-135A/E/R Aircraft Maintenance Database model shall be referred to as the "KC-135 Database Model;" and the previous aircraft maintenance data used during your CPX experience shall be referred to as the "Previous CPX Model."

3. You do not need to place your name anywhere on this evaluation.

4. Using the scale shown at the top of the next two pages, please place the number which corresponds to your opinion on the line preceding each statement. Then, comment as to why you feel as you do in the space provided.

Strongly agree	Tend to agree	Can't agree or disagree	Tend to disagree	Strongly disagree
1	2	3	4	5

1. ______ The KC-135A/E/R database model is more realistic than the previous CPX model.

   Why or how?

2. _____ Aircraft maintenance data from the previous CPX model could be used to plot aircraft maintenance actions, inspections, and turn times more easily than using the KC-135 database model.

   Why or how?

3. _____ Aircraft maintenance data from the previous CPX model could be used to determine aircraft availability more easily than using the KC-135 database model.

   Why or how?

4. _____ Aircraft maintenance discrepancies using the previous CPX model was more realistic than using the KC-135 database model.

   Why or how?

5. _____ Supply data (WUC, NSN, NOUN) for a needed part was easier to find using the previous CPX model than it was using the KC-135 database model.

   Why or how?

Strongly agree	Tend to agree	Can't agree or disagree	Tend to disagree	Strongly disagree
1	2	3	4	5

6. _____ The previous CPX model made it easier to determine if a part was essential to fly a given mission than does the KC-135 database model.

   Why or how?

7. _____ Aircraft flying and maintenance requirements are easier to track during exercise play using the previous CPX model than using the KC-135 database model.

   Why or how?

8. _____ I was better trained on the procedures necessary to carry out my duties as a response cell member using the previous CPX model than I was using the KC-135 database model.

   Why or how?

PLEASE USE THE REVERSE SIDE
FOR YOUR ADDITIONAL COMMENTS AND OBSERVATIONS

Appendix F: Training Session Slides

KC-135A/E/R AIRCRAFT MAINTENANCE DATABASE

PURPOSE

The database and associated materials are designed to help response cells maintain aircraft availability at realistic levels, generate demands for parts, and provide improved realism during command post exercises involving the KC-135A/E/R aircraft

Figure F-1. KC-135A/E/R Aircraft Maintenance Database Purpose

PHASE INSPECTION REQUIREMENTS

- Due every 200 +/- 20 (180 to 220) flying hours (since last phase).
- Takes 31 hours to complete.
- Use the longer of either the 31-hour phase time or the database fix time and then add the 4-hour preflight/ thruflight.
- Reset the aircraft's phase hours to 0.0 hours (accumulated).
- Aircraft is flushable if less than 2 or more than 10 hours from phase start time.

Figure F-2. Phase Inspection Requirements

HPO INSPECTION REQUIREMENTS

- Due every 50 +/- 5 (45 to 55) flying hours (since last HPO or phase).
- Takes two hours to complete.
- The database fix time and the 4-hour preflight/ thruflight times are added to the 2-hour HPO.
- Reset HPO hours to 0.0 when:
  - -- An HPO inspection is completed.
  - -- A phase inspection is completed (HPO is an integral part of phase).

Figure F-3. HPO Inspection Requirements

WORKSHEET PLOTTING REQUIREMENTS

- Refer to Figure B-3 in information guide for sample.
- Plot launch and landing symbols at the scheduled takeoff and landing times. Connect with a straightline (timeline).
- Post scheduled takeoff and landing times, ARCT, fuel load, and sortie duration above and below the timeline.
- Post new phase and HPO times by adding sortie duration to previous times.
- Extend timeline for inspection, if due.

(Continued)

Figure F-4. Worksheet Plotting Requirements

WORKSHEET PLOTTING REQUIREMENTS (Continued)

- Post the aircraft T.N. to the database for the first unassigned maintenance event.
- On the CPX MX Worksheet 1 and/or 2, extend the time-line plot for the number of fix hours to the right of the asterisk in the Lndg Code column.
- Post the maintenance event control number below the timeline as shown in Figure B-3.
- Extend the plot for the 4-hour preflight/thruflight. Post a circle at the end of the timeline.
- Check the availability of needed parts in WRSK and reflect the consumption.
- Repeat above steps for each aircraft as required.

Figure F-5. Worksheet Plotting Requirements (Continued)

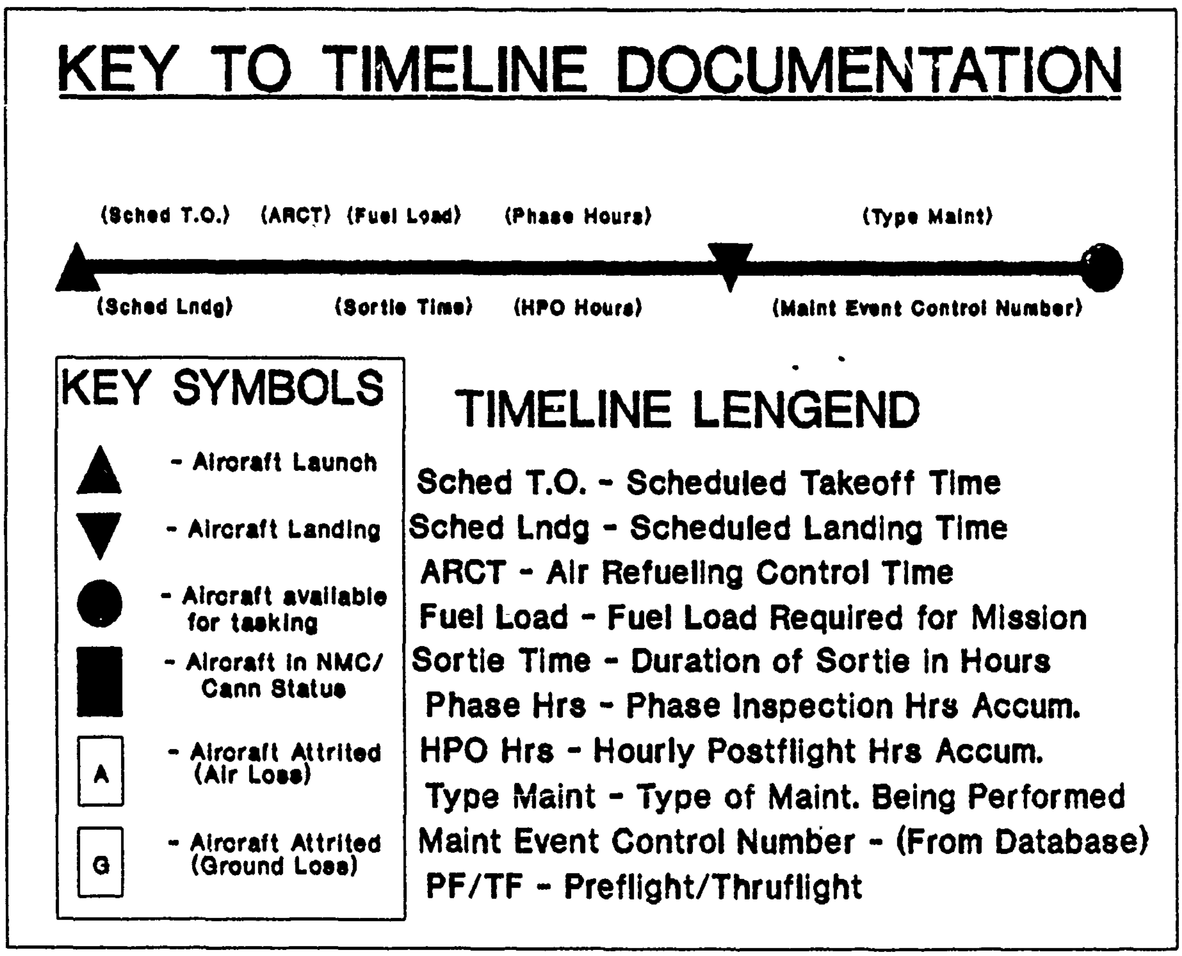

Figure F-6. Key To Timeline Documentation

BACKGROUND

- Improve realism in command post exercises (CPX)
- Typical models used to provide realism in CPX:
  - -- Percentage based models
  - -- Random number generator models
- The historical database model

Figure F-7. Background

OBJECTIVES

- Evaluate whether the KC-135 database model provides response cell members with the needed information to:
  - -- maintain aircraft availability at realistic levels
  - -- generate realistic demand for parts
  - -- improve realism during CPXs
- Evaluate the utility of the Information Guide as a "stand alone" document to support the database model

Figure F-8. Objectives

EXERCISE SUPPORT MATERIAL

- Information Guide
  - -- MESL
  - -- Practice Database
  - -- Copy of CPX MX Worksheets 1 and 2
- KC-135A/E/R Aircraft Maintenance Database
- WRSK Listing
- CPX MX Worksheets 1 and 2
- Message forms
- Task Incompletion forms

Figure F-9. Exercise Support Material

Appendix G: Mock Exercise Team Mission Tasking Orders

MISSION TASKING ORDER

TEAM 1

Date	Line Nmbr	Take-Off Time	Lndg Time	Sortie Drtn	Air Refueling Control Time (ARCT)		Fuel Load
20 Apr	1	0100	0700	6	0330	0415	140K
	2	0100	0700	6	0335	0420	140K
	3	0200	0900	7	0330	0415	150K
	4	0200	0900	7	0335	0420	150K
	5	0300	1100	8	0415	0730	160K
	6	0300	1100	8	0420	0735	160K

MISSION TASKING ORDER

AM 1

Date	Line Nmbr	Take-Off Time	Lndg Time	Sortie Drtn	Air Refueling Control Time (ARCT)			Fuel Load
21 Apr	1	0000	0500	5	0230			80K
	2	0000	0500	5	0235			80K
	3	0100	0800	7	0230	0400		120K
	4	0100	0800	7	0235	0405		120K
	5	0200	1100	9	0400	0630	0800	180K
	6	0200	1100	9	0405	0635	0835	180K

MISSION TASKING ORDER

TEAM 2

Date	Line Nmbr	Take-Off Time	Lndg Time	Sortie Drtn	Air Refueling Control Time (ARCT)			Fuel Load
20 Apr	1	0100	0600	5	0245			80K
	2	0100	0600	5	0250			80K
	3	0200	0800	6	0400	0630		100K
	4	0200	0800	6	0405	0635		100K
	5	0300	1000	7	0715	0800		130K
	6	0300	1000	7	0720	0805		130K
	7	0400	1200	8	0715	0800	0900	180K
	8	0400	1200	8	0720	0805	0905	180K

MI. SION TASKING ORDER

TEAM 2

Date	Line Nmbr	Take-Off Time	Lndg Time	Sortie Drtn	Air Refueling Control Time (ARCT)		Fuel Load
21 Apr	1	0000	0400	4	0145		70K
	2	0000	0400	4	0150		70K
	3	0100	0600	5	0255		80K
	4	0100	0600	5	0300		80K
	5	0200	0800	6	0500		100K
	6	0200	0800	6	0505		100K
	7	0300	1000	7	0600	0700	130K
	8	0300	1000	7	0605	0705	130K

MISSION TASKING ORDER

TEAM 3

Date	Line Nmbr	Take-Off Time	Lndg Time	Sortie Drtn	Air Refueling Control Time (ARCT)			Fuel Load
20 Apr	1	0100	0600	5	0250			80K
	2	0100	0600	5	0255			80K
	3	0100	0600	5	0300			80K
	4	0200	0800	6	0415	0510		120K
	5	0200	0800	6	0420	0515		120K
	6	0200	0800	6	0430	0520		120K
	7	0300	1000	7	0445	0525	0655	170K
	8	0300	1000	7	0450	0530	0700	170K
	9	0300	1000	7	0455	0535	0705	170K

MISSION TASKING ORDER

TEAM 3

Date	Line Nmbr	Take-Off Time	Lndg Time	Sortie Drtn	Air Refueling Control Time (ARCT)			Fuel Load
21 Apr	1	0000	0600	6	0225	0310	0355	180K
	2	0000	0600	6	0230	0315	0400	180K
	3	0000	0600	6	0235	0320	0405	180K
	4	0200	0800	6	0510	0630		150K
	5	0200	0800	6	0515	0635		150K
	6	0200	0800	6	0520	0640		150K
	7	0400	1000	6	0710			120K
	8	0400	1000	6	0715			120K
	9	0400	1000	6	0720			120K

MISSION TASKING ORDER

TEAM 4

Date	Line Nmbr	Take-Off Time	Lndg Time	Sortie Drtn	Air Refueling Control Time (ARCT)			Fuel Load
20 Apr	1	0100	0500	4	0255			70K
	2	0100	0500	4	0300			70K
	3	0100	0500	4	0305			70K
	4	0200	0700	5	0410			90K
	5	0200	0700	5	0415			90K
	6	0200	0700	5	0420			90K
	7	0300	0900	6	0520	0640		150K
	8	0300	0900	6	0525	0645		150K
	9	0400	1100	7	0555	0705	0840	180K
	10	0400	1100	7	0600	0710	0845	180K

MISSION TASKING ORDER

TEAM 4

Date	Line Nmbr	Take-Off Time	Lndg Time	Sortie Drtn	Air Refueling Control Time (ARCT)		Fuel Load
21 Apr	1	0000	0600	6	0300		120K
	2	0000	0600	6	0305		120K
	3	0100	0700	6	0400		120K
	4	0100	0700	6	0405		120K
	5	0400	1000	6	0710	0805	150K
	6	0400	1000	6	0715	0810	150K
	7	0400	1000	6	0720	0815	150K
	8	0600	1200	6	0850	1000	150K
	9	0600	1200	6	0855	1005	150K
	10	0600	1200	6	0900	1110	150K

MISSION TASKING ORDER

TEAM 5

Date	Line Nmbr	Take-Off Time	Lndg Time	Sortie Drtn	Air Refueling Control Time (ARCT)			Fuel Load
20 Apr	1	0100	0500	4	0255			70K
	2	0100	0500	4	0300			70K
	3	0100	0500	4	0310			70K
	4	0200	0700	5	0420			90K
	5	0200	0700	5	0425			90K
	6	0200	0700	5	0430			90K
	7	0300	0900	6	0520	0630		140K
	8	0300	0900	6	0525	0635		140K
	9	0300	0900	6	0530	0640		140K
	10	0400	1100	7	0750	0830		150K
	11	0400	1100	7	0755	0835		150K
	12	0400	1100	7	0800	0840		150K
	13	0500	1300	8	0710	0900	1015	180K
	14	0500	1300	8	0715	0905	1020	180K

MISSION TASKING ORDER

TEAM 5

Date	Line Nmbr	Take-Off Time	Lndg Time	Sortie Drtn	Air Refueling Control Time (ARCT)		Fuel Load
21 Apr	1	0000	0600	6	0255		100K
	2	0000	0600	6	0300		100K
	3	0200	0800	6	0455		100K
	4	0200	0800	6	0500		100K
	5	0400	1000	6	0555		100K
	6	0400	1000	6	0600		100K
	7	0600	1200	6	0925	1005	150K
	8	0600	1200	6	0930	1010	150K
	9	0600	1200	6	0935	1015	150K
	10	0800	1400	6	1100	1210	150K
	11	0800	1400	6	1105	1215	150K
	12	0800	1400	6	1110	1230	150K

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Vita

Captain Lyndon S. Anderson was born on 1 March 1958 in Sarasota, Florida. He enlisted in the United States Air Force in March 1981 and was later assigned to F. E. Warren AFB, Wyoming, as a Missile System's Analyst for the Minuteman III Nuclear Weapon System. He worked as an Electromechanical Team Chief, and later as a Master Inspector/Evaluator in the Maintenance Deputate's Quality Assurance Division. He earned a Bachelor of Science Degree in Industrial Technology from Southern Illinois University in June 1983. He was commissioned through the USAF Officer Training School in March 1985. Upon graduation from the Aircraft Maintenance Officer's Course, he was assigned to Carswell AFB, Texas. Some of his duties included Officer-in-Charge (OIC) of the wing's KC-135A Tanker Branch and B-52H Bomber Branch. Following the incorporation of the Readiness Oriented Logistic System (ROLS) maintenance concept, his duties included OIC of the newly formed Specialist Branch and Bomber Maintenance Unit. He later worked as the squadron's Assistant Maintenance Supervisor until entering the School of Systems and Logistics at the Air Force Institute of Technology in June 1989. Upon graduation, he will be assigned to the Air Force Logistics Management Center at Gunter AFB, Alabama.

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13. ABSTRACT *(Maximum 200 words)* This study, under the sponsorship of HQ SAC/LGL, investigated a method to improve realism in Command Post Exercises (CPX) involving the KC-135A/E/R aircraft by developing a historical database model. The model is based on the premise that realistic data collected from actual war-like missions can be placed in a database for use by response cell members to provide simulated, yet realistic, logistical requirements during CPXs. European Tanker Task Force flying mission data was used as source data for the development of the model. Associated documentation was also developed to support the model. A mock exercise simulating a CPX was used to test the model and its associated documentation. Analysis of the test results lead the researcher to conclude that the model provides response cell members with a useful tool to obtain realistic logistical information they need to carry out their duties effectively. Recommendations include using the model and documentation as required by HQ SAC/LGL, and conducting further research to test the hypothesis that historical database models improves realism at the response cell level during CPXs.

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